EO 19 Nov 68
310-4

TM 11-5820-469-20

DEPARTMENT OF THE ARMY TECHNICAL MANUAL

See C2, Chg 3 Inserted, 4, 5

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ORGANIZATIONAL MAINTENANCE MANUAL

RADIO TERMINAL SET AN/TRC-80

HEADQUARTERS, DEPARTMENT OF THE ARMY
26 JUNE 1963

WARNING

Be careful when working on the 200-volt dc high-voltage circuits, or on the 120- and 208-volt ac line connections.

DON'T TAKE CHANCES!
DANGEROUS RF VOLTAGES ARE EXPOSED ON THE ANTENNA.
EXTREMELY HIGH VOLTAGES EXIST IN THE FOLLOWING UNITS:

Klystron drawer . . . . . 7,700 volts
Amplifier-Converter AM-3303/TRC-80 . . 1,600 volts

GASOLINE HANDLING

Do not refuel the power unit and do not handle or leave open gasoline containers or plastic gasoline containers in the vicinity of the radio set while the transmitter is on. Do not smoke or light open fires within 25 feet of the gasoline containers or the engine generator.

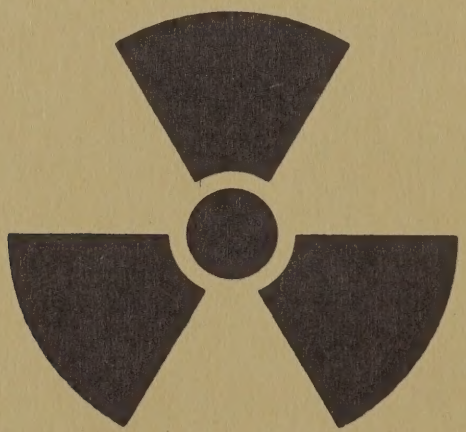
RF BURNS

Do not stand on the roof of the shelter or in the path of radiation from the radio set while the transmitter is on. Turn off the power amplifier before climbing to the shelter roof.

WIND WARNING

Do not assemble or disassemble the antenna when wind gusts exceed 60 mph or sustained winds exceed 40 mph.

RADIATION HAZARD



Co60
Ni63

Tube-types OA2WA and OB2 are used in this equipment and contain radioactive material (para 4, TM 11-5820-469-10). These tubes are potentially hazardous when broken; see qualified medical personnel and the Safety Director if you are exposed to or cut by broken tubes. Use extreme care in replacing these tubes and follow safe procedures in their handling, storage, and disposal (para 87, TM 11-5820-469-10).

Never place radioactive tubes in your pocket.

Use extreme care not to break radioactive tubes while handling them.

Never remove radioactive tubes from cartons until ready to use them.

Refer to paragraph 87 in TM 11-5820-469-10 on handling, storage, and disposal of radioactive material.

mk
p.3.70

CHANGE
No. 5

HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *17 June 1970*

mk 7-21-70

Organizational Maintenance Manual

RADIO TERMINAL SET AN/TRC-80B

TM 11-5820-469-20, 26 June 1963, is changed as follows:

1. Remove old pages and insert new pages as indicated below.

Remove pages —	*Insert pages —*
65-72	65- 72.14

2. File this change sheet in front of the publication for reference purposes.

By Order of the Secretary of the Army:

W. C. WESTMORELAND,
General, United States Army,
Chief of Staff.

Official:

KENNETH G. WICKHAM,
Major General, United States Army,
The Adjutant General.

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Distribution:

To be distributed in accordance with DA Form 12-51 (qty rqr block No. 450) requirements for Organizational maintenance literature for the AN/TRC-80 Radio Terminal Set.

23 pp

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e. Radio Frequency Amplifier AM–3308/TRC–80. The 4,400.00- to 4,999.95-MHz signal from the transmit converter is used as the driving power for a four cavity klystron tube located in the power amplifier. The output of the power amplifier (1 kilowatt) is applied through a flexible waveguide to the bipolarized feedhorn and antenna reflector.

56. Receiving Path

a. Antenna AS–1270/TRC–80. Polarized 4,400.00- to 4,999.95-MHz signals are received by the antenna reflector and passed through the bipolarized feedhorn and a flexible waveguide to a circulator. In diversity operation, when two signals are being received, the circulator routes the received signals to the inputs of receiver No. 1 and receiver No. 2.

b. Amplifier-Converter AM–4916/TRC. The amplifier-converter (receive converter) accepts two input signals. One signal is a 1,082.5- to 1,232.4875-MHz signal from the synthesizer. The synthesizer signal is multiplied by a factor of 4 (by the varactor multiplier). The other signal is the incoming radio-frequency (RF) signal from the circulator. The two signals are applied to a mixer circuit; and a difference frequency of 70 MHz is selected, amplified, and routed to Intermediate Frequency Amplifier AM–6208/TRC–80B.

c. Intermediate Frequency Amplifier AM–6208/TRC–80B. The 70-MHz input signal applied to the IF amplifier is mixed with he output of a 78-MHz oscillator circuit. The 8–MHz difference frequency is amplified and applied to a discriminator combiner circuit that recovers the order-wire (original vf teletypewriter and speech) and baseband (telephone terminal) signals. When both receivers are used (in diversity operation) the output of the combiners and redundancy connections are combined; and the order-wire and baseband signals of IF amplifier no. 2 are routed to the multiplexer (order-wire) and to the telephone terminal (baseband). The outputs of IF amplifier No. 2 are also applied to the monitor.

d. Demultiplexer Multiplexer TD–550/TRC–80. The multiplexer accepts its order-wire output from IF amplifier No. 2 and separates the vf teletypewriter and speech signals.

(1) *Teletypewriter circuit.* The 300- to 4,325-Hz order-wire signal is applied to a bandpass filter that rejects the speech signal and passes the 4,225- to 4-325-Hz vf teletypewriter signals. The bandpassed signals are mixed with a 3–kHz signal and converted from 4,225 Hz and 4,325 Hz to 1,225 Hz and 1,325 Hz. The teletypewriter signals are routed to the teletype switch panel and monitor.

(2) *Speech circuits.* The 300- to 4,325-Hz orderwire signal is also applied to a low-pass filter that rejects all frequencies above 3,500-Hz; therefore, only the speech signals are passed. The low-pass filter output is amplified and routed to the control panel.

d. 1. *Telephone Terminal TA–833/TRC.* The telephone terminal accepts its baseband input from IF amplifier no. 2, converting and separating the baseband to the original four channels of voice and/or voice frequency signals. The subgroup demodulator accepts the 12- to 28–kHz baseband from the IF amplifier and translates it to a 92.6- to 108-kHz frequency band. The composite 92.6 to 108-kHz signal is applied to channel modems that extract the individual channel signal and recover the original voice frequency signals. For each channel, the voice frequency signal is applied to a signaling/termination unit. This unit converts the four-wire (telephone terminal) circuits to either two-wire or four-wire landline circuits and extracts the 1600-Hz signaling tone for 20-Hz ringdown signaling. The output of the telephone terminal is routed through the power and signal entry panel to connecting landlines.

e. Output Circuits. Teletypewriter signals intended for the local teletypewriter are routed from the control panel to the telegraph terminal. The telegraph terminal converts the vf signals to dc signals and applies the dc pulses to the local teletypewriters. Speech signals intended for the operator are routed to the local headset. Speech and teletypewriter signals for pts are applied through the power and signal entry panel to the connecting landlines.

APPENDIX I

REFERENCES

Following is a list of applicable references available to the organizational maintenance personnel of Radio Terminal Set AN/TRC-80B.

AR 755-15	Disposal of Unwanted Radioactive Material.
DA Pam 310-4	Index of Technical Manuals, Technical Bulletins, Supply Manuals (types 7, 8, and 9), Supply Bulletins, and Lubrication Orders.
DA Pam 310-7	U.S. Army Equipment Index of Modification Work Orders.
MWO 11-5800-207-30/1	Modification of Radio Terminal Sets AN/TRC-80, AN/TRC-90, AN/TRC-90A, AN/TRC-90B, and AN/TRC-129 to include a 12,000-Channel Synthesizer.
TM 5-6115-299-20	Organizational Maintenance Manual: Generator Set, Gasoline Engine, 10 Kw, Ac, 120/208V, 3 Phase, 400 Cycle, Skid Mounted (Bogue Electric Model 5380A) (FSN 6115-855-9572).
TM 11-5805-246-10	Operator's Manual: Terminal, Telegraph, TH-5/TG.
TM 11-5805-246-20	Organizational Maintenance Manual: Terminal, Telegraph TH-5/TG.
TM 11-5805-356-12	Operator and Organizational Maintenance Manual including Repair Parts and Special Tools List: Terminal, Telegraph AN/TCC-29 (including Terminal, Telegraph TH-22/TC and Converter, Telegraph-Telephone Signal CV-425/U).
TM 11-5815-206-12	Organizational Maintenance Manual: Teletypewriter Set AN/PGC-1 and Teletypewriters TT-4A/TG, TT-4B/TG, TT-4C/TG, TT-335/TG, and TT-537/G.
TM 11-5820-469-10	Operator's Manual: Radio Terminal Set AN/TRC-80B.
TM 11-5820-469-20P	Organizational Maintenance Repair Parts and Special Tools List: Radio Terminal Set AN/TRC-80.
TM 11-6625-274-12	Operator's and Organizational Maintenance Manual: Test Sets, Electron Tube TV-7/U, TV-7A/U, TV-7B/U, and TV-7D/U.
TM 11-6625-366-15	Organizational, DS, GS, and Depot Maintenance Manual: Multimeter TS-352B/U.
TM 38-750	The Army Maintenance Management System (TAMMS).

APPENDIX II

MAINTENANCE ALLOCATION

Section I. INTRODUCTION

A2-1. General

This appendix provides a summary of the maintenance operations covered in the equipment literature for the AN/TRC-80B.

It authorizes categories of maintenance for specific maintenance functions on repairable items and components and the tools and equipment required to perform each function. This appendix may be used as an aid in planning maintenance operations.

A2-2. Maintenance Functions

Maintenance functions will be limited to and defined as follows:

a. INSPECT. To determine serviceability of an item by comparing its physical, mechanical, and electrical characteristics with established standards.

b. TEST. To verify serviceability and to detect incipient electrical or mechanical failure by use of special equipment such as gages, meters, etc. This is accomplished with external test equipment and does not include operation of the equipment and operator type tests using internal meters or indicating devices.

c. SERVICE. To clean, to preserve, to charge, and to add fuel, lubricants, cooling agents, and air. If it is desired that elements, such as painting and lubricating, be defined separately, they may be so listed.

d. ADJUST. To rectify to the extent necessary to bring into proper operating range.

e. ALIGN. To adjust two or more components or assemblies of an electrical or mechanical system so that their functions are properly synchronized. This does not include setting the frequency control knob of radio receivers or transmitters to the desired frequency.

f. CALIBRATE. To determine the corrections to be made in the readings of instruments or test equipment used in precise measurement. Consists of the comparison of two instruments, one of which is a certified standard of known accuracy, to detect and adjust any discrepancy in the accuracy of the instrument being compared with the certified standard.

g. INSTALL. To set up for use in operational environment such as an encampment, site, or vehicle.

h. REPLACE. To replace unserviceable items with serviceable like items.

i. REPAIR. To restore an item to serviceable condition through correction of a specific failure or unserviceable condition. This function includes, but is not limited to welding, grinding, riveting, straightening, and replacement of parts other than the trial and error replacement of running spare type items such as fuses, lamps, or electron tubes.

j. OVERHAUL. Normally, the highest degree of maintenance performed by the Army in order to minimize time work in process is consistent with quality and economy of operation. It consists of that maintenance necessary to restore an item to completely serviceable condition as prescribed by maintenance standards in technical publications for each item of equipment. Overhaul normally does not return an item to like new, zero mileage, or zero hour condition.

k. REBUILD. The highest degree of materiel maintenance. It consists of restoring equipment as nearly as possible to new condition in accordance with original manufacturing standards. Rebuild is performed only when required by operational considerations or other paramount factors and then only at the depot maintenance category. Rebuild reduces to zero the hours or miles the equipment, or component thereof, has been in use.

l. SYMBOLS. The uppercase letter placed in the appropriate column indicates the lowest level at which that particular maintenance function is to be performed.

A2-3. Explanation of Format

a. Column 1, Group Number. Not applicable.

b. Column 2, Functional Group. Column 2 lists the noun names of components, assemblies, subassemblies and modules on which maintenance is authorized.

c. Column 3, Maintenance Functions. Column 3 lists the maintenance category at which performance of the specific maintenance function is authorized. Authorization to perform a function at any category also includes authorization to perform that function at higher categories. The codes used represent the various maintenance categories as follows:

Code	*Maintenance category*
C	Operator/crew
O	Organizational maintenance
F	Direct support maintenance
H	General support maintenance
D	Depot maintenance

d. Column 4, Tools and Test Equipment. Column 4 specifies, by code, those tools and test equipment required to perform the designated function. The numbers appearing in this column refer to specific tools and test equipment which are identified in Section III.

e. Column 5, Remarks. Self-explanatory.

A2-4. Explanation of Format of Section III, Tool and Test Equipment Requirements

The columns in Section III, Tools and Test Equipment Requirements, are as follows:

a. Tools and Equipment. The numbers in this column coincide with the numbers used in the tools and equipment column of the Maintenance Allocation Chart. The numbers indicate the applicable tool for the maintenance function.

b. Maintenance Category. The codes in this column indicate the maintenance category normally allocated the facility.

c. Nomenclature. This column lists tools, test, and maintenance equipment required to perform the maintenance functions.

d. Federal Stock Number. This column lists the Federal stock number of the specific tool or test equipment.

e. Tool Number. Not used.

SECTION II. MAINTENANCE ALLOCATION CHART

MAINTENANCE ALLOCATION CHART

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTIONS											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
	RADIO TERMINAL SET AN/TRC-80B	O												
			O										1,49,65	
			F										1,4,17,23,33, 44 thru 48	
			H										1,9,12,17,23, 33,38,39,44 thru 56,11,15	
			D										1,4,7,8,12, 17,22,23,26, 33,35,38,39, 43 thru 47, 49 thru 63	
				O										
					O								64	
					F								1,7,33,47	
						F							1,4,33,43, 44,45,46	
						H							1,4,7,12,17, 39,43 thru 47	
										O			64,65	
										F			7,65	
										H			7,8,65	
										D			7,8,65	Plus shop support
											D		7,8,65	Plus shop support
												D	7,8,65	Plus shop support

MAINTENANCE ALLOCATION CHART

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTIONS											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
	AN/TRC-80B (cont.)													
	AMPLIFIER MODULATOR GROUP OA-3832/TRC-80	0												
									0				64	
										F			7	
										H			8	
	AMPLIFIER CONVERTER OA-3303/TRC-80	0												
									0				64	
										F			7	
										H			8	
	MODULATOR MULTIPLIER MD-465/TRC-80	0												
									0				64	
										F			7	
										H			8	
	AMPLIFIER RADIO FREQUENCY AM-3308/TRC	0												
									0				64	
										F			7,15	
										H			8	

MAINTENANCE ALLOCATION CHART

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTIONS											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
	AN/TRC-80 (cont.)													
	CONTROL DRAWER	0												
									0				64	
										F			7	
										H			8	
	KLYSTRON DRAWER	0												
									0				64	
										F			7	
										H			8	
	POWER SUPPLY DRAWER	0												
									0				11,64	
										F			7	
										H			8	
	ANTENNA AS-1270/TRC-80	0												
									D				7,8	Plus shop support
										O			64	
										F			7	
										H			8	
	FEED HORN AND STRUTS	0												
									0					

MAINTENANCE ALLOCATION CHART

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTIONS											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
	AN/TRC-80B (cont.)													
	PATCH KIT	0												
									0					Expendable
	REFLECTOR INFLATABLE	0												
									0				64	
										0			64,65	
	WAVEGUIDE	0												
									0					
	CONSOLE, COMMUNICATION CONTROL SB-1564/TRC-80	0												
									0				64	
										F			7	
										H			8	
	COOLER, AIR ELECTRONIC EQUIPMENT HD-545/TRC-80	0												
									0				64	
										F			7	
										H			8	

MAINTENANCE ALLOCATION CHART

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTIONS											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
	AN/TRC-80B (cont.)													
	DEMULTIPLEXER-MULTIPLEXER TD-550/TRC-80	O												
									O				64	
										H			7,8	
	ENGINE GENERATOR									#				See TM 5-6115-299-20
	CONTROL PANEL, AUXILIARY (ENGINE GENERATOR)									#				See TM 5-6115-299-20
	HEADSET ASSEMBLY	O												
									O					
										D			7,8	Running spares
	MONITOR, AUDIO FREQUENCY-RADIO FREQUENCY MX-4039/TRC-80	O												
									O				64	
										F			7	
										H			8	
	PANEL, POWER DISTRIBUTION SB-1565/TRC-80	O												
									O				64	
										F			7	
										H			8	

MAINTENANCE ALLOCATION CHART

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTIONS											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
	AN/TRC-80B (cont.)													
	RECEIVER, RADIO OA-3831/TRC-80	O												
									O				64	
										F			7	
										H			8	
	SYNTHESIZER O-1462A/TRC	O												Fault alarm indications isolate to defective chassis parts. Excludes printed circuits.
			F										16,17,9, 10	
									O				64	Entire unit
									F				6,7	Modules for direct shipment to depot
										F/H			6,7	Non modular repair, includes chassis parts, etc.
										D	D			Complete overhaul & module repair

MAINTENANCE ALLOCATION CHART

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTIONS											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
	AN/TRC-80B (cont.)													
	AMPLIFIER CONVERTOR AM-3302/TRC-80	0												
									0				64	
										F			7	
										H			8	
	AMPLIFIER, IF, AM-3288/TRC-80	0												
									0				64	
										F			7	
										H			8	
	POWER SUPPLY PP-3313/TRC-80	0												
									0				64	
										F			7	
										H			8	
	POWER SUPPLY PP-3314/TRC-80	0												
									0				64	
										F			7	
										H			8	

MAINTENANCE ALLOCATION CHART

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTIONS											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
	AN/TRC-80B (cont.)													
	TELETYPE HYBRID ASSEMBLY	O												
									O				64	
										F			7	
										H			8	
	TELETYPEWRITER TT-335/TG	#							#	#				See TM 11-5815-206-12
	TERMINAL TELEGRAPH	#							#	#				See TM 11-5805-246-20

MAINTENANCE ALLOCATION CHART

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTIONS											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
	AN/TRC-80B (cont.)													
	FOUR CHANNEL MULTPLEX													
	POWER REGULATOR 12D5-MX		O											Operational
			F										1,2	
									O					
										D			7,8	Plus shop facilities
	POWER SUPPLY 16A1-TH		O											Operational
			F										3,4,5,6	
									O					
										D			7,8	Plus shop facilities
	SIGNALING/TERMINATION UNIT 20H1-MX	O												Visual
			O											Operational
			H										4,7,8,9,10	
									O					
										D			7,8	Plus shop facilities

MAINTENANCE ALLOCATION CHART

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTIONS											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
	AN/TRC-80B (cont.)													
	CHANNEL MODEM 30P2-MX	O												Visual
			O											
			D										8,12,13,14, 41,42	
									O					
										D			7,8	Plus shop facilities
	SUB GROUP MODULATOR 33H1-MX	O												
			O											
			D										4,7,19,12, 37,42	
									O					
										D			7,8	Plus shop facilities
	SUB GROUP MODULATOR 34F1-MX	O												Visual
			O											Operational
			D										4,7,12,37,42	
									O					
										D			7,8	Plus shop facilities

MAINTENANCE ALLOCATION CHART

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTIONS											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
	AN/TRC-80B (cont.)													
	FILTER 45M1-MX	O												Visual
			O											Operational
			H										4,7,12	
									O					
										D			7,8	Plus shop facilities
	RECEIVE-CONVERTER 54V2-TH	O												Visual
			O											Operational
			F										1,3.5,12,30	
			H										9,25,27,28,29	
			D										18-26, 31-36	
									F					
										H				
										D			7,8	Plus shop facilities

MAINTENANCE ALLOCATION CHART

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTIONS											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
	AN/TRC-80B (cont.)													
	OSCILLATOR 60F1-MX	O												Visual
			O											Operational
			F										4,12	
									F					
										D			7,8	Plus shop facilities
	CARRIER SELECTOR 61A2-( )MX	O												Visual
			O											Operational
			H										4,5,9,12,17 42	
									O					
										D			7,8	Plus shop facilities
	PRIMARY FREQUENCY SUPPLY 62Y1-1MX	O												Visual
			O											Operational
			H										5,9,12,17,42	
									O					
										D			7,8	Plus shop facilities

MAINTENANCE ALLOCATION CHART

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTIONS											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
	AN/TRC-80B (cont.)													
	DEVIATION AND LEVEL MONITOR 900B-4	O												Visual
			O											Operational
			F										4,7	
			D										1,4,7,38,39	
									F					
										D			7,8	Plus shop support
	RECEIVER-AUTOMATIC BANDWIDTH CONTROL	O												Visual
			O											Operational
			F											Operational
			H										1,4,17,39,40	
						H							1,4,17,39,40	
									F					
										D			7,8	Plus shop support

MAINTENANCE ALLOCATION CHART

GROUP NUMBER	COMPONENT ASSEMBLY NOMENCLATURE	MAINTENANCE FUNCTIONS											TOOLS AND EQUIPMENT	REMARKS
		INSPECT	TEST	SERVICE	ADJUST	ALIGN	CALIBRATE	INSTALL	REPLACE	REPAIR	OVERHAUL	REBUILD		
	AN/TRC-80B (cont.)													
	4/12 CHANNEL DISCRIMINATOR-COMBINER	O												Visual
			O											Operational
			F										1,37	
			H										4,7,9,14,28 38,39	
						H								
									F					
										D			7,8	Plus shop support

#Indicates that maintenance guidance will be found in documents referenced in remarks column.

TOOL AND TEST EQUIPMENT REQUIREMENTS

TOOLS AND EQUIPMENT	MAINTENANCE CATEGORY	NOMENCLATURE	FEDERAL STOCK NUMBER	TOOL NUMBER
		AN/TRC-80B (cont.)		
1	F,H,D	MULTIMETER ME-26/U	6625-360-2493	
2	F,H,D	HP 6266A	4935-736-3110	
3	F,H,D	MULTIMETER ME-368/U		
4	F,H,D	VOLTMETER, VT ME-30A/U	6625-669-0742	
5	F,H,D	MULTITESTER AN/URM-105	6625-581-2036	
6	F,H,D	VARIAC TF-171/U		
7	F,H,D	TOOL KIT ELECTRONIC EQUIPMENT TK-100/G	5180-605-0079	
8	F,H,D	TOOL KIT ELECTRONIC EQUIPMENT TK-105/G	5180-610-8177	
9	H,D	OSCILLOSCOPE AN/USM-281A	6625-053-3112	
10	H,D	BALANCING TRANSFORMER HP 11004A, 11005A	6625-567-5837	
11	H,D	POWER SUPPLY PP-3514/U	6625-445-6933	
12	H,D	FREQUENCY COUNTER AN/USM-207	6625-911-6368	
13	H,D	SIGNAL GENERATOR AN/URM-127	6625-783-5965	
14	H,D	WAVE ANALYZER TS-1830/U	6625-806-5929	
15	H,D	SIGNAL GENERATOR TS-421/U	6625-669-0228	
16	H,D	VOLTMETER, VACUUM TUBE ME-30E/U	6625-643-1670	
17	H,D	SIGNAL GENERATOR AN/GRM-50	6625-868-8353	
18	D	SIGNAL GENERATOR GENERA RADIO GR-1218B & GR-1269A	6625-920-1006	
19	D	TWT AMPLIFIER H.P.-489A	6625-615-6002	
20	D	NOISE GENERATOR SG-678/G	6625-887-7783	
21	D	FREQUENCY METER H.P. 537A	6625-930-9687	

TOOL AND TEST EQUIPMENT REQUIREMENTS

TOOLS AND EQUIPMENT	MAINTENANCE CATEGORY	NOMENCLATURE	FEDERAL STOCK NUMBER	TOOL NUMBER
		AN/TRC-80B (cont.)		
22	D	NOISE FIGURE METER H.P. 342A	6625-892-5286	
23	D	SIGNAL GENERATOR AN/URM-52	6625-546-6663	
24	D	ATTENUATOR H.P. G-382A	5985-771-8421	
25	D	ATTENUATOR DAVEN 640		
26	D	POWER METER AN/USM-161	6625-892-5541	
27	D	SWEEP GENERATOR AN/USM-203	6625-086-7165	
28	D	SIGNAL GENERATOR AN/URM-103	6625-868-8352	
29	D	R.F. VOLTMETER AN/URM-145	6625-973-3986	
30	D	POWER SUPPLY H.P. 6220B		
31	D	COAX SLOTTED LINE AN/UPM-108	6625-682-4494	
32	D	R.F. TUNING UNIT POLARAD		
33	F,H,D	MULTITESTER TS-352/U	6625-242-5023	
34	D	POWER TEST SET TS-779A/U	6625-739-1394	
35	D	COAX SLOTTED LINE AN/USM-37	6625-814-8357	
36	D	DETECTOR H.P.-420A	4935-583-1526	
37	D	SUB GROUP FILTER 45K1-MX		
38	D	DEVIATION METER ME-57/U	6625-647-3737	
39	D	RECEIVER R-390A/URR	5820-538-7555	
40	H	TUBE POWER SUPPLY		
41	D	NOISE MEASURING SET POLARAD T-CB		
42	D	SELECTIVE VOLTMETER SIERRA PHILCO 128A	6625-935-4206	

TOOL AND TEST EQUIPMENT REQUIREMENTS

TOOLS AND EQUIPMENT	MAINTENANCE CATEGORY	NOMENCLATURE	FEDERAL STOCK NUMBER	TOOL NUMBER
		AN/TRC-80B (cont.)		
43	F,H,D	BLOWER -60 CPS (COLLINS RADIO)		
44	F,H,D	POWER SUPPLY PP-3313	5820-823-2984	
45	F,H,D	POWER SUPPLY PP-3314	5820-823-2983	
46	F,H,D	SIGNAL GENERATOR AN/USM-44	6625-669-4031	
47	F,H,D	SIGNAL GENERATOR SG-71/FCC	6625-669-0255	
48	F,H,D	TEST SET, ELECTRON TUBE TV-7D/U	6625-820-0064	
49	H,D	ANALYZER, SPECTRUM TS-723/U	6625-668-9418	
50	H,D	ATTENUATOR, VARIABLE CN-318/U	5950-752-3144	
51	H,D	ATTENUATOR, VARIABLE CN-762/U	5985-893-8669	
52	H,D	ATTENUATOR, VARIABLE CN-764/U	5985-020-2990	
53	H,D	COMPARATOR, CREQ CM-77/USM	6625-778-3780	
54	H,D	FREQUENCY METER AN/URM-80	6625-649-4286	
55	H,D	TEST SET, TELEPHONE TS-559A/FT	6625-540-9051	
56	H,D	WATCH, STOP	6645-719-8670	
57	D	CALORIMETER, VARIAN V-4030/1r.		
58	D	LOOP CONVERTER (COLLINS RADIO #522-6798-00)		
59	D	MANOMETER, VERNON HILL AND CO. TYPE CT		
60	D	NOISE SOURCE HP HPG-347A	6625-887-7783	
61	D	SLOTTED LINE SECTION HP HPG 810B	6625-086-7754	
62	D	TEST,SET, ELECTRON TUBE TV-2/U	6625-669-0263	
63	D	WATER LOAD, VARIAN V-4023B		

TOOL AND TEST EQUIPMENT REQUIREMENTS

TOOLS AND EQUIPMENT	MAINTENANCE CATEGORY	NOMENCLATURE	FEDERAL STOCK NUMBER	TOOL NUMBER
		AN/TRC-80B (cont.)		
64	O	TOOL KIT ELECTRONIC EQUIPMENT TK-101/G	5180-064-5178	
65	O	PATCH KIT (FOR ANT BAG)		

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HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *1 October 1969*

Organizational Maintenance Manual

RADIO TERMINAL SET AN/TRC–80B

TM 11–5820–469–20, 26 June 1963, is changed as follows:

1. Title is changed as shown above.

2. Line 9, page 2 of cover, Warning. Change Amplifier-Converter AM–3303/TRC–80 . . . . 1,600 volts to Amplifier-Converter AM–4917/TRC . . . 1,600 volts.

3. This change reflects equipment modifications on the AN/TRC–80A incorporated by MWO 11–5820–469–50/1.

4. Remove old pages and insert new pages as indicated below.

Remove pages	*Insert pages*
1 through 6.2	1 through 6
7 through 10	7 through 10
16.3 and 16.4	16.3 and 16.4
19 through 20.2, 21 through 22.2	19 through 22
23 through 24.2, 25 through 34.4	23 through 26, 26.1 27 through 34
35 through 38.2, 39 through 40.2	35 through 40, 40.1 through 40.2
41 through 46.2, 47 through 48.2	41 through 48.2
51 and 52	51 and 52
55 and 56	55 and 56
59 through 62	59 through 62
64.1 and 64.2	64.1 and 64.2
65 and 66	65 and 66
69 through 72	69 through 72
75 through 76.2, 77 through 78.2	75 through 78

5. File this change sheet in the front of the manual for reference purposes.

67 PP

By Order of the Secretary of the Army:

W. C. WESTMORELAND,
General, United States Army,
Chief of Staff.

Official:

KENNETH G. WICKHAM,
Major General, United States Army,
The Adjutant General.

Distribution:

To be distributed in accordance with DA Form 12–51 (qty rqr block no. 450) organizational maintenance requirements for the AN/TRC–80 Radio Terminal Set.

☆ U.S. GOVERNMENT PRINTING OFFICE: 1969—390–924/124

TECHNICAL MANUAL
No. 11-5820-469-20

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON, D.C. 20315, *26 June 1963*

RADIO TERMINAL SET AN/TRC-80 B

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*This manual supersedes TM 11-5820-469-20, 2 April 1962.

CHAPTER 1

INTRODUCTION

Note. The old term "cycles" and the new term "hertz" appear in this manual. Both terms are synonymous.

1. Scope

a. This manual covers organizational maintenance of Radio Terminal Set AN/TRC-80B. The installation and operation of this equipment is covered in TM 11-5820-469-10.

b. Organizational maintenance for Radio Terminal Set AN/TRC-80B consists of the following:

(1) Preventive maintenance (para 4).

(2) Monthly checks and services (para 5 and 6).

(3) Quarterly checks and services (para 7 and 8).

(4) Lubrication (para 11).

(5) Cleaning and replacement of air filters (para 10 and 12).

(6) Troubleshooting (para 13 through 33).

(7) Coaxial cables and connections (para 34 through 39).

(8) Removal and replacement procedures (para 40 through 48).

(9) Tube testing and replacement procedures (para 49 and 50).

(10) Repairs and adjustments (para 51 through 53.1).

c. Refer to TM 11-5820-469-10 for nomenclature and common name assignments used throughout this manual.

2. Indexes of Publications

a. DA Pam 310-4. Refer to the latest issue of DA Pam 310-4 to determine whether there are new editions, changes, or additional publications pertaining to the equipment.

b. DA Pam 310-7. Refer to DA Pam 310-7 to determine whether there are modification work orders (MWO's) pertaining to the equipment.

2.1. Reporting of Equipment Manual Improvements

The reporting of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to DA Publications) and forwarded direct to Commanding General, U.S. Army Electronics Command, ATTN: AMSEL-ME-NMP-AD, Fort Monmouth, N. J., 07703.

CHAPTER 2

MAINTENANCE INSTRUCTIONS

Section I. MAINTENANCE CHECKS AND SERVICES

3. Tools, Materials, and Test Equipment Required

A list of parts normally stocked for organizational maintenance is contained in TM 11-5820-469-20P. The materials and tools required for organizational maintenance are listed below. The test equipment authorized for organizational maintenance is listed in the allocation of tools for maintenance functions section of the maintenance allocation chart (appx II).

a. Tools.

(1) Tool Kit, Radio Repair, TK-115/G.
(2) Key wrench, 5/16-inch hexagonal (supplied with AN/TRC-80 B).
(3) Key wrench, 1/2-inch hexagonal (supplied with AN/TRC-80 B).

b. Materials.

(1) Cleaning Compound (Federal stock No. 7930-395-9542).
(2) Cleaning cloth.
(3) Lubricating Oil, Instrument (OAI) MIL-L-6085 (Federal stock No. 9150-257-5449).
(4) Lubricating Oil, General Purpose VV-L-820 (Federal stock No. 9150-252-6174).
(5) Grease, Aircraft and Instrument (GL) MIL-G-3278.
(6) Lubricating Oil, General Purpose MIL-L-7870 (Federal stock No. 9150-263-3490).
(7) Fine sandpaper.
(8) Detergent.
(9) Antenna repair kit (Collins part No. 024-0296-00).
(10) Grease, Aircraft, MIL-G-25760 (Federal stock No. 9150-656-1501).

4. Preventive Maintenance

a. Preventive maintenance is the systematic care, inspection, and servicing of equipment to maintain it in serviceable condition, prevent breakdowns, and assure maximum operational capability. Preventive maintenance is the responsibility of all personnel concerned with the equipment and includes the inspection, testing, and repair or replacement of parts, subassemblies, or units that inspection and tests indicate would probably fail before the next scheduled periodic service. Preventive maintenance service and inspections of the AN/TRC-80B are made at monthly and quarterly intervals unless otherwise directed by the commanding officer. The maintenance services should be scheduled concurrently with the periodic service schedule of the remaining components of the Pershing Weapons System.

b. Maintenance forms and records to be used and maintained on this equipment are specified in TM 38-750.

5. Monthly Maintenance

Perform the maintenance functions indicated in the monthly preventive maintenance checks and services chart (para 6) once each month. A month is defined as approximately 30 calendar days of 8-hour-per-day operation. If the equipment is operated 16 hours a day, the monthly preventive maintenance checks and services should be performed at 15-day intervals. Adjustment of the maintenance interval must be made to compensate for any unusual operating conditions. Equipment maintained in a standby (ready for immediate operation) condition must have monthly preventive maintenance checks and services performed on it. Equipment in limited storage (requires service before operation) does not require monthly preventive maintenance.

6. Monthly Preventive Maintenance Checks and Services Chart

Seq. No.	Item	Procedure	References
1	Liftscrew lubrication----------	Lubricate the liftscrew (para 11*b*, b.l. and fig. 1).	Para 51.
2	Antenna elevation jackscrew lubrication.	Lubricate the jackscrew (para 11*c* and fig. 2).	None.
3	Azimuth mechanism lubrication --	Lubricate the azimuth mechanism (para 11*d* and fig. 3).	None.
4	Antenna platform locking pins lubrication.	Lubricate the antenna platform locking pins (para 11*e* and fig. 4).	Para 52.
5	Mesh-type filter cleaning -------	Clean the mesh-type metal filter elements located in the evaporator unit of air conditioner, and rack blower (para 10*b*).	Para 12.
6	Fiberglass filter cleaning -------	Clean the fiberglass filter elements located in the power amplifier (para 10*c*).	Para 12.
7	Engine generator service -------	Check the oil level on the dipstick	Refer to the instruction book issued with the engine generator, and lubricate the engine generator as directed.
8	Battery----------	Check the electrolyte level of the battery. Use the multimeter to check the battery voltage under load.	None.
9	Liftscrew chain ----------	Inspect the liftscrew chain for visible sag. If sag is noted, tighten the chain by following the procedure in paragraph 51.	Fig. 37.
10	Platform antenna locks ---------	Check to see that all four antenna platform locking handles lock in the elevated or retracted position. Perform the antenna liftscrew adjustment (para 52) if any of the antenna platform locking handles will not lock.	None.
11	Antenna bag----------	Check the antenna bag for tears or leaks.	Para 53.

7. Quarterly Maintenance

Quarterly preventive maintenance checks and services on the AN/TRC-80 B are required. The periodic daily and monthly services constitute a part of the quarterly preventive maintenance checks and services and must be performed concurrently. All deficiencies or shortcomings will be recorded in accordance with the requirements of TM 38-750. Perform all the checks and services listed in the quarterly preventive maintenance checks and services chart (para 8) in sequence.

8. Quarterly Maintenance Checks and Services Chart

Seq. No.	Item	Procedure	References
1	Completeness ----------	Check to see that the equipment is complete (appx II, TM 11-5820-469-10).	None.

Seq. No.	Item	Procedure	References
2	Installation	See that the equipment is properly installed (para 23 and 24, TM 11-5820-469-10).	None.
3	Cleanliness	See that the equipment is clean (para 81, TM 11-5820-469-10).	Para 10.
4	Obvious defects	Inspect the items listed in paragraph 9 for obvious defects.	None.
5	Publications	See that all publications are complete, serviceable, and current.	DA Pam 310-4.
6	Modifications	Check DA Pam 310-4 to determine if new applicable MWO's have been published. All URGENT MWO's must be applied immediately. All ROUTINE MWO's must be scheduled.	TM 38-750 and DA Pam 310-4.
7	Flexible waveguides	See that waveguides and connectors are free of sand and dirt (para 81, TM 11-5820-469-10).	None.
8	Lubrication	Lubricate the equipment (para 11)	None.
9	Air filters	Clean the air filters (para 10)	Para 12.
10	Pluckout items	Inspect the clamps and seating of pluckout items. Check for wrong, bent, or broken parts.	None.
11	Spare parts	Check all spare parts (operator and organizational) for general condition and method of storage. There should be no evidence of overstock, and all shortages must be on valid requisitions.	Appx II, TM 11-5820-469-10; and TM 11-5820-469-20P.
12	Antenna fabric	See that the antenna bag is free of cuts or tears.	Para 53.
13	Fuses	See that the fuses in use, and the spares, are of the correct value as indicated in TM 11-5820-469-10.	Para 83, TM 11-5820-469-10.
14	Connections	Check the connections to the engine generator and fuel line. Check the connections to remote facilities and army area net (para 24, TM 11-5820-469-10).	Para 9.
15	Knobs, dials, and switches	While making the operating checks (items 17 through 35), observe that the mechanical action of each knob, dial, and switch is smooth and free of external or internal binding. *Caution:* **Do not rotate the tuning or levels controls when these controls are preset for operation at a specific frequency. *Touch only those controls* that are part of the normal operation check.**	Para 26 through 52, TM 11-5820-469-10.
16	Engine generator	Refer to the instruction book issued with the engine generator and see that the oil level on the dipstick is correct and that all lubrication points are correctly lubricated.	

Seq. No.	Item	Procedure	References
17	Engine generator start ------ --	Turn on the engine generator (para 55, TM 5820-469-10). See that the OIL PRESSURE light on the starting panel is out.	Para 16 and 23.
18	Engine generator control panel --	*a.* Check to see that the HEAD TEMPERATURE, OIL PRESSURE, OVER VOLTAGE, UNDER VOLTAGE, OVER FREQUENCY, and UNDER FREQUENCY panel lights are all out; and that the battery ammeter indicates a slight charge, the voltmeter indicates 208 volts, and the frequency meter indicates 400 cps. *b.* Set the LOAD CONTROL switch to ON and observe that the POWER ON indicator lights.	Para 23*a* and *b*.
19	Circuit breaker panel ----------	Set the MAIN BREAKER, RACK POWER, FLUSHING BLOWER and the AIR COND circuit breakers to ON. Note that all circuit breakers remain at ON.	Para 16.
20	Switch panel ----------	*a.* Turn the HUT LIGHTS and FLUSHING BLOWER switches on, and note that the HUT LIGHTS, FLUSHING BLOWER and AIR FAILURES lights come on. *b.* Turn on the RACK POWER switch and see that the blowers come on and, after a slight delay, the AIR FAILURES indicator goes off.	*a.* Para 24. *b.* Para 24.
21	Control panel ----------	Depress the POWER pushbutton, and note that the panel pushbutton lamps light.	Para 84, TM 11-5820-469-10.
22	Rack A1 ----------	Turn on the (filament and B+) power switches in the transmit converter, modulator-multiplier, and multiplexer. Note that the filament indicator lamps on the transmit converter, modulator-multiplier, and multiplexer light. After a 30-second delay, the TIME DELAY and B+ indicators of the modulator-multiplier and multiplexer light. After a 3-minute delay, the TIME DELAY indicator of the transmit converter lights.	Para 24, item 5.
23	Rack A3	Turn the POWER switches on the 3 synthesizer units to ON. Check that the power indicator on the fault panel lights.	Para 27, item 1.

Seq. No.	Item	Procedure	References
24	If. power supplies (rack A4 and A5).	Set the POWER switches to ON and observe that the POWER indicators light. After slight delay, the TIME DELAY and POWER SUPPLIES indicators should light. Note that AIR FAILURE RACKS 4 and 5 lamp on the switch panel is off.	Para 24, item 7.
24.1	Converter and Mux power supplies (rack A5).	Set the power switches to ON and observe that the POWER indicators light.	Para 30a. Item 1 and para 32.1a. Item 3.
25	Antenna	Erect and inflate the antenna (para 57, 58, and 59, TM 11-5820-469-10). Observe that the antenna bag inflates normally and is correctly orientated in azimuth and elevation.	Para 53.
26	Frequency selection and tuning ..	Tune both receivers and the transmitter to the desired frequency settings (para 60 through 66 of TM 11-5820-469-10). Note that all tuning controls are set to approximately the desired frequencies. All meter indications are within normal limits.	TM 11-5820-469-10
27	Radio circuit operation (AN/TRC-80B to AN/TRC-80 B).	Operate the controls listed below: *a.* Press the DISCRETE pushbutton and note that the DISCRETE pushbutton illuminates green. *b.* Press the DISCRETE LINE SEL pushbutton and note that the ARMY (lower) portion of the pushbutton illuminates. **Note.** The discrete line is now connected to the Army area net. *c.* Press the COMMAND pushbutton and note that the COMMAND pushbutton illuminates green. *d.* Press the VF TTY pushbutton and note that the COMMAND (upper portion) of the pushbutton illuminates green. *e.* Set the TH-5A/TG or TH-22/TG switches at NORM and 4W. *f.* On the teletypewriter switch panel, set the OPERATING MODE switch to NORMAL DC LOOP. *g.* Press the RING pushbutton and note that the RING pushbutton flashes white. (This action signals distant AN/TRC-80B operator.) *h.* Push the headset push-to-talk button to talk; release to listen. The distant operator's voice should be clearly audible. *i.* Operate the teletypewriter equipment and observe that the teleprinter prints either transmit or receive copy.	Para 33, item 1. Para 33, item 1.
28	Programmer test station radio circuit.	**Note.** This action will set up combined speech and teletypewriter circuit between local pts facility and the distant AN/TRC-80B. Position the following controls: *a.* Press the DISCRETE LINE SEL pushbutton and observe that the COMMAND (upper) portion of the pushbutton illuminates. *b.* Press the COMMAND pushbutton and observe that the COMMAND (amber) light becomes brighter. *c.* Press the VF TTY pushbutton and observe that the COMMAND (upper) portion of the pushbutton illuminates.	

Seq. No.	Item	Procedure	References
		d. Set the TH-5A/TG or TH-22/TG switches to NORM and 4W. *e.* Set the teletypewriter switch panel OPERATING MODE switch at VF 2W/4W and the PTS-BY PASS switch at ON. *f.* Note that teletypewriter and voice communication between pts and distant AN/TRC-80B operator is normal.	Para 33, item 2.
29	Three-party (army area net, pts, and local operator) dc teletypewriter circuit.	**Note.** Setting up this three-party circuit disrupts the radioteletypewriter operation. Set the following controls: *a.* Press the DC TTY pushbutton and note that the ARMY AND PTS (lower) portion of the pushbutton lights. *b.* On the teletypewriter switch panel, place the OPERATING MODE switch at NORMAL DC LOOP and the PTS-BY PASS switch to OFF. *c.* On the TH-5A/TG or TH-22/TG set the switches to NORM and 4W. *d.* Operate the teletypewriter equipment and check to see that three-party telewriter communication between the army area net, pts, and local operator is possible.	Para 33, item 3.
30	Army four-wire-two-wire vf tty circuit operation.	*a.* Press the VF TTY pushbutton and note that the ARMY (lower) portion of pushbutton lights. *b.* Note that teletypewriter communication between the Army area net and local operator is possible.	Para 33, item 5.
31	Army-local AN/TRC-80B telephone circuit operation.	Operate the pushbuttons on the control panel as follows: *a.* Press the DISCRETE LINE SEL pushbutton and note that the COMMAND (upper) portion of the pushbutton lights. *b.* Press the ARMY pushbutton and note that the ARMY (green) light becomes brighter. *c.* Press the RING pushbutton and note that it flashes white. *d.* Press the headset push-to-talk button to talk; release to listen. The army operator's voice should be clearly audible.	Para 33, item 4.
32	Local operator-pts speech circuit operation.	**Note.** Setting up this circuit does **not** disrupt any existing teletypewriter circuits. *a.* Press the DISCRETE pushbutton and note that it lights green. *b.* Press the RING pushbutton and note that it flashes white. *c.* Press the headset push-to-talk button to talk; release to listen. The pts operator's voice should be clearly audible.	Para 33, item 6.
33	Pts-local operator intercom circuit operation.	*a.* Press the INTERCOM pushbutton and note that the INTERCOM (green) light becomes brighter. *b.* Press the headset push-to-talk button to talk; release to listen. The pts operator's voice should be clearly audible.	Para 33, item 7.

Seq. No.	Item	Procedure	References
34	Local operator-remote vehicle speech circuit operation.	*a.* Press the VEHICLE pushbutton and note that the VEHICLE (green) light becomes brighter. *b.* Press the headset push-to-talk button to talk; release to listen. The distant vehicle operator's voice should be clearly audible.	Para 33, item 8.
35	Answering calls (An incoming call is indicated by a flashing pushbutton or a voice call).	*a.* Press the desired pushbutton (INTERCOM, VEHICLE ARMY, COMMAND, or DISCRETE) to complete the circuit. Note that the selected indicator stops flashing. *b.* Press the headset press-to-talk pushbutton to talk; release to listen. The distant operator's voice should be clearly audible.	Para 20.

9. Visual Inspection

This inspection should be performed as part of the quarterly maintenance checks and services inspection (para 8, sequence 4).

Warning: **Obtain permission to turn off all power (except the hut lights) before performing the following inspection. Before touching an exposed electrical part, short-circuit the part to ground with a shorting stick.**

a. Air Ducts. Check the klystron blower ducts and clamps for proper fit and condition. Check the condition and fit of the molded rubber ducts on the rack blowers in racks A1 and A4.

b. Coaxial Connectors. Check the coaxial cable connectors for proper fit and cleanliness.

c. Power Amplifier Interlock Circuit. See that the three drawers in the power amplifier cabinet fit snugly to insure continuity of the interlock circuit.

d. Air Vents. Inspect the gaskets of the hinged exterior power amplifier (pa) vents and the preheat port for leaks and worn spots.

e. Motors. Inspect the rack-mounted blowers and the antenna air compressor and blower for overheating, dirt, and loose connections.

Warning: **Never stand on the shelter roof when the power amplifier is on.**

f. Antenna Mechanism. Check the operation of the antenna azimuth and elevation adjustment mechanism and the footbrake and azimuth-locking mechanism.

g. Coaxial Resonators. Inspect the mechanical portions of the variable coaxial resonators in the transmit and receive converters for cleanliness.

h. Capacitors. Inspect the electrolytic capacitors for leakage and bulging cases.

Section II. CLEANING AND LUBRICATION

10. Cleaning

a. General. Inspect the equipment in the operator's compartment, the engine generator compartment, and the antenna compartment. The equipment should be free of dirt, grease, and fungus. Paragraph 81 of TM 11-5820-469-10 covers the items that must be cleaned by the operator. The organizational maintenance man should clean the vitreous or glass surface on the wire-wound resistors with cleaning compound and wash the air filters as specified below. Mesh-type metal and fiberglass filters are used in the radio set. Both types can be cleaned and reused. To clean the filters, follow the procedures in *b* and *c* below. The removal and replacement of air filters is covered in paragraph 12.

b. Cleaning Mesh-Type Metal Air Filters.

Warning: **Prolonged breathing of cleaning compound fumes is dangerous; make certain that adequate ventilation is provided. Cleaning compound is flammable; do not use near a flame. Avoid contact with the skin; wash off any that spills on your hands.**

(1) Immerse the filter in a shallow container filled with cleaning compound.

(2) Agitate the filter to remove all dirt.

(3) Shake off excess cleaning compound, and allow the filter to dry thoroughly.

(4) Spray or paint a very light coating of oil, VV-L-820, on the wire mesh.

c. Cleaning Fiberglass Filters.

(1) Immerse the air filter, with the inlet side up, in a shallow container filled with warm water to which a small amount of detergent has been added.

(2) Agitate the filter to remove all dirt.

Caution: **Never pass a high-pressure stream of water through the filter because this will displace the fibers and impair the efficiency of the filter.**

(3) Rinse the filter in clean water, and allow it to dry.

11. Lubrication

Warning: **Never lubricate the equipment with the power on.**

a. General. Lubrication points for the radio set are shown in figures 1 through 4, 4.1, and 4.2. The lubrication intervals specified below are satisfactory for temperate-zone operation. If the equipment is operated in excessively dusty or humid areas, the lubrication intervals specified must be adjusted to prevent damage or excessive wear of the equipment. *Lubrication is performed only after the radio set is made inoperative.* The types of lubricants used, the lubrication interval, and the lubrication instructions are given in *b* through *e* below. Before performing any of the following lubrication procedures, clean the mechanism with cleaning compound.

Note. The procedures given in *b* below apply to equipment procured on Order No. 4255-PP-61. Refer to *b.1* below for liftscrew lubrication instructions for equipment procured on Order No. 15058-PP-62.

b. Liftscrew Lubrication for Equipment Procured on Order No. 4255-PP-61 (fig. 1). Lubricate the antenna platform liftscrews at 30-day intervals. One liftscrew is located at each corner of the antenna compartment. The liftscrew lubrication procedure is as follows:

(1) If the antenna platform is in the stowed position, raise it as directed in TM 11-5820-469-10.

Note. 1. If it becomes difficult to lock all four of the antenna platform locking handles in either the elevated or lowered positions, refer to paragraph 52.

Note 2. If it is necessary to lubricate the azimuth drive mechanism, perform the procedures in *d* below before proceeding.

Note 3. If it is necessary to lubricate the antenna platform locking pins, perform the procedures in *e*(2) and (3) below before proceeding.

(2) On rack A2, remove the equipment rack-securing screws from the right-hand side of the engine generator control panel, the switch panel, and the control panel (fig. 5, TM 11-5820-469-10).

(3) Swing the panels aside to expose the antenna compartment access hatch.

(4) Loosen the six captive wingbolts, and remove the hatch cover to gain access to the antenna compartment.

(5) Apply a thin coating of grease (GL) to all four liftscrews.

(6) Clean the liftscrew thrust bearing grease fittings located on the bottom flange of each liftscrew.

(7) Apply grease (GL) to the grease fittings of all four thrust bearings.

(8) Apply a light coating of oil, MIL-L-7870 directly to the liftscrew chain.

(9) Replace the antenna compartment hatch covers; swing the engine generator control panel, the switch panel, and the control panel back to their normal positions; and replace the rack-securing screws on the right-hand side of the rack.

e. Rack Blower Air Filters. The two rack blower filters (part of Cooler, Air, Electronic Equipment HD–545/TRC–80) are located at the bases of racks A1 and A4 (fig. 7, and 9, TM 11–5820–469–10). Identical mesh-type metal filter elements are used in the three blowers.

(1) Loosen the four captive screws that secure the filter holder to the blower housing.

(2) Loosen the two screw-type fasteners that secure the retaining frame to the inside of the filter holder, and remove the retaining frame.

(3) Remove the filter element and clean it as described in paragraph 10*b*.

(4) Replace the filter into the filter holder and replace the retaining frame by use of the two screw-type fasteners.

(5) Replace the filter holder on the blower housing and tighten the four captive screws.

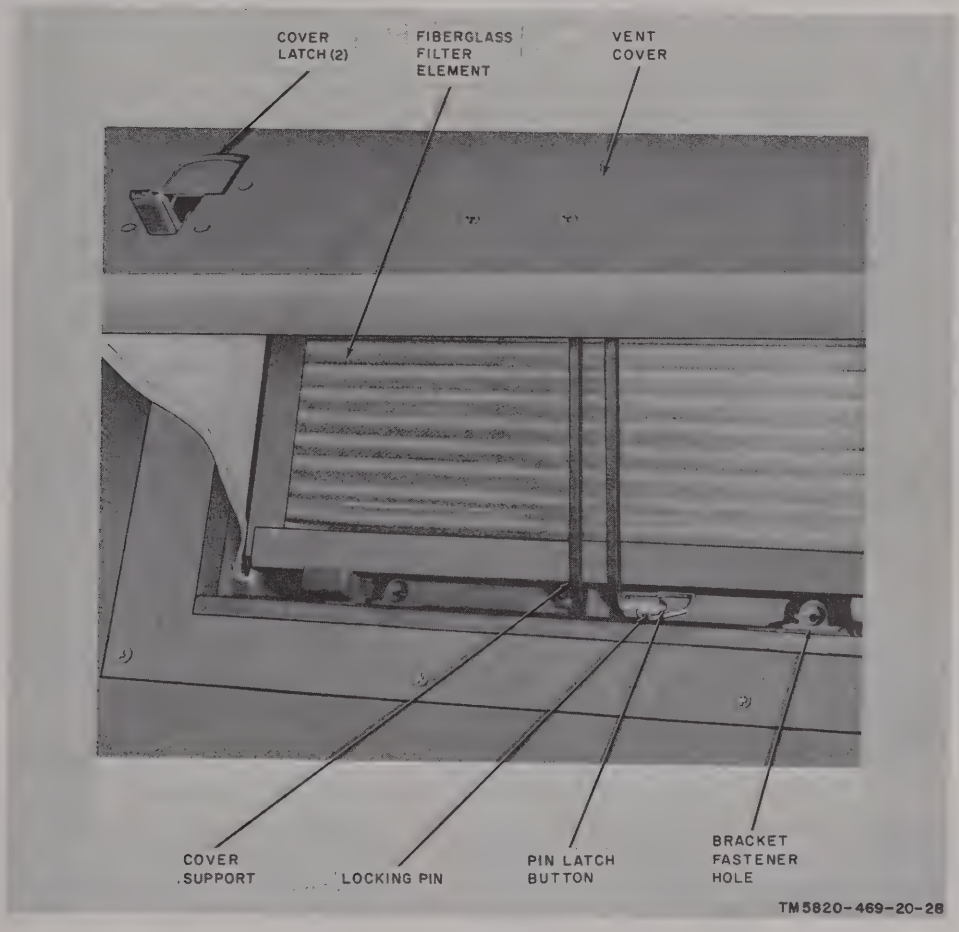


Figure 6. Power amplifier shelter vent filter detail.

CHAPTER 3
TROUBLESHOOTING

Section I. ORGANIZATION OF TROUBLESHOOTING PROCEDURES

13. General Instructions

Troubleshooting of this equipment is based on the operational check contained in the quarterly preventive maintenance checks and services chart (para 8). When the trouble symptom is not known, perform all functions starting with item 17 in the quarterly maintenance service and inspection chart and proceed through the items until an abnormal condition or result is observed. When an abnormal condition or result is observed, note the paragraph reference and perform the checks and corrective actions indicated in the referenced troubleshooting chart or procedure. When the defect has not been sectionalized to an equipment group (receiving equipment, transmitting equipment, power, etc), refer to paragraphs 15 through 20. When the trouble symptom is known, or when the defect has been sectionalized to a specific unit, refer directly to the troubleshooting chart for that unit. If the corrective measures indicated do not restore normal performance, or if no corrective measures are listed, troubleshooting is required by higher category maintenance personnel.

14. Troubleshooting Techniques

a. General. Many troubles that develop in the AN/TRC-80B may be sectionalized without the use of external test equipment. Defective operation that is developing and that will eventually result in equipment failure can frequently be located by the senses of smell, touch, and hearing. By becoming thoroughly familiar with the equipment during periods of normal operation, the maintenance man can sense that something is wrong when he hears an unfamiliar sound, notices that an equipment case or cover is warmer (or colder) than usual, or becomes aware of an odor that is not normally present.

b. Built-In Test Equipment. In addition to indicator lights and fuse indicators on all units, the AN/TRC-80B contains front panel meters on the engine generator control panel, the three synthesizer units, the monitor panel, the receive and transmit converters, and the power amplifier. Some of the meters have associated switches that permit operational checks of various circuits within a chassis. Become familiar with the meter readings during normal operation; maximum use of these meters will permit the organizational repairman to localize most troubles without using external test equipment.

c. Abnormal Sounds. During normal operation of the AN/TRC-80B, the sounds of the engine generator and engine cooling blower, the flushing blower, the klystron cooling blower, the teletypewriter motor, and the two rack blowers will blend to result in a characteristic background *noise* level. Erratic operation of any of these units will often result in a distinguishable change in the overall sound.

Section II. SECTIONALIZATION OF TROUBLES

15. General

Trouble in the AN/TRC-80B equipment will generally be the result of a defect in one of the following equipment groups: the primary power, the frequency generating and transmission equipment, the receiving equipment, or the antenna system. The following paragraphs in this section cover the procedures that should be followed to sectionalize defects to a unit within an equipment group. If the symptoms listed below describe the difficulties being

encountered, perform the recommended corrective measures.

16. Primary Power Trouble Sectionalization Chart

The chart below lists the symptoms peculiar to the engine generator and the associated control panel and circuit breaker panel. For defects within the individual dc power supplies, refer to the troubleshooting charts in the localizing procedures.

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
1	Entire radio set is dead, engine generator running.	*a.* Switches incorrectly set on engine generator control panel.	*a.* See that LOAD CONTROL switch is set to ON. Refer to engine generator troubleshooting charts (para 23).
		b. MAIN BREAKER on circuit breaker panel is tripped to OFF.	*b.* Reset MAIN BREAKER. If MAIN BREAKER trips again, VOLTAGE CONTROL switch on engine-generator control panel may be incorrectly set, causing excessive load current. Refer to engine-generator control panel troubleshooting chart (para 23*b*).
2	Engine generator running, only certain equipment areas appear to have primary power.	Circuit breakers on switch panel turned off, or blown fuse in one of the racks.	See that circuit breakers on switch panel are on. Refer to para 24.
3	Engine generator runs intermittently or will not run.	Defect in engine generator-------	Refer to instruction manual on engine generator.

17. Transmission Trouble Sectionalization Chart

When the radio set receives but does not transmit voice or teletypewriter signals, trouble exists within one of the major components that comprise the transmitting equipment (transmit synthesizer, modulator-multiplier, transmit converter, and power amplifier). Normal transmit operation is indicated by intolerance readings on the power amplifier POWER IN meter, the POWER OUT meter, and the monitor meter (with S2 in the A (voice deviation) position). The chart below sectionalizes trouble to one of the major components within the transmitting equipment. When diversity operation is used (TM 11-5820-469-10), two radio sets are used at the primary terminal, one designated *control* and the other designated *slave*. Satisfactory operation is possible with one transmitter inoperative; however, failure of the second transmitter will disrupt communication.

Item No.	Sectionalization procedure	Normal indication	Corrective measure or reference
1	On power amplifier POWER OUT meter, check INCIDENT KW scale and REFLECTED KW scale.	INCIDENT KW scale indication is not less than .85 KW; REFLECTED KW scale not more than .08 KW.	Check POWER IN meter indication. If POWER IN meter indication is normal, defect is in power amplifier; refer to paragraph 29. If power indication is not normal, check cable connection from transmit converter. Proceed to item 2.
2	On transmit converter (fig. 9), set meter function selector switch to OUTPUT.	Meter indication of 50----------	If no meter indication, or low indication is obtained, proceed to item 3.
3	On transmit converter (fig. 9) set meter function switch to position H.	Meter indication of 20 to 50.	If indications are normal proceed to item 5. If no meter indication or low indication is obtained check cable connection from transmit synthesizer. Check transmit synthesizer output level control setting. Proceed to item 4.

Item No.	Sectionalization procedure	Normal indication	Corrective measure or reference
4	On the transmit 0-1462A/TRC synthesizer (middle-mounted synthesizer) of rack A3, check the OUT OF LOCK indicator and TUNING VOLTAGE meter.	OUT OF LOCK indicator should be off, and TUNING VOLTAGE meter should indicate an approximate midscale reading (50).	If indications on synthesizer are normal, trouble is in the transmit converter, refer to para 28. If indications are not normal, refer to para 27.
5	On transmit converter (fig. 9) set meter function switch to OUTPUT. Tune control J to a frequency 70 MHz lower.	Meter indication of 50 or more.	If indication is normal, trouble is in modulator-multiplier, refer to paragraph 26. If indication is not normal, refer to para 28.
6	On monitor, set switch S2 to position A and press TEST SIGNAL pushbutton on control panel.	Voice deviation indication on meter at SET POINT (red marker line) on meter.	Refer to items 3, 9 and 10 of paragraph 20.

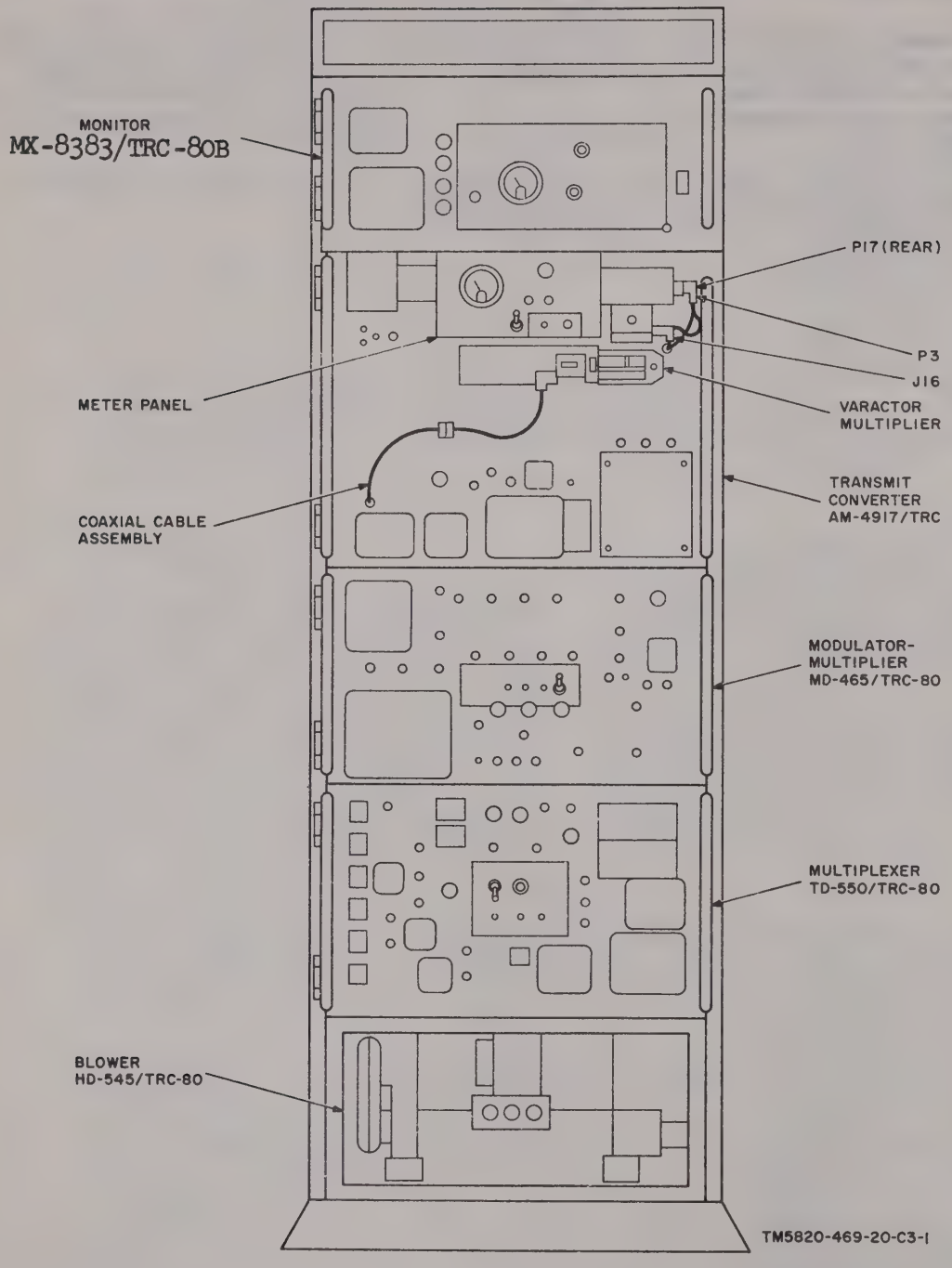


Figure 9. Rack A1 equipment with covers removed.

18. Receiver Trouble Sectionalization Chart (Diversity Operating, Battery Terminal)

When diversity operation is used, the two receivers (fig. 10 and 11) at the battery terminal are used and are tuned to different frequencies. In the event of one receiver failure, satisfactory operation is possible with only one receiver. To sectionalize the defective unit (receiver) converter, receive synthesizer, and if. amplifier) within the receiver, perform the procedures listed in the chart below:

Item No.	Sectionalization procedure	Normal indication	Corrective measure or reference
1	On receive converter, set METER FUNCTION SELECTOR switch to RECEIVE SIG DET.	Meter on receive converter panel indicates 40 or more and is unsteady	If indication is normal, trouble is in baseband amplifier of IF amplifier chassis; refer to para 32. If indication is not normal, proceed to Item 2.
2	On IF amplifier, set switch S1 on 8 MC IF NO 2 subchassis to RCVR GAIN 6.	Meter M1 on the 8MC IF NO 2 subchassis indicates 6.	If reading is not normal proceed to Item 3; if reading is normal, proceed to Item 5.
3	On switch panel, disconnect coaxial patch cable from IF IN jack. On the bandwidth control subchassis of the IF amplifier adjust the RCVR GAIN control fully clockwise.	Meter M1 on the 8 MC IF NO 2 subchassis indicates 4 or greater.	If reading is not normal, trouble is in IF amplifier; refer to para 32. If reading is normal, proceed to Item 4.
4	On switch panel, re connect coaxial patch cable to IF IN jack.	Meter M1 on the 8 MC IF NO 2 subchassis indicates full scale or greater.	If reading is not normal, trouble is in receive converter, refer to para 30. If reading is normal, proceed to Item 5.
5	On the bandwidth control subchassis of the IF amplifier, adjust the RCVR GAIN control for a reading of 6 on meter M1 in the 8 MC IF NO 2 subchassis. On the receive converter set the METER FUNCTION SELECTOR switch to J-TUN DET position, set TUN DET METER ADJUST control fully clockwise. Press TUNE-UP SIGNAL switch on receive converter.	Meter on receive converter panel indicates 70 or greater when TUNE-UP SIGNAL switch is pressed.	If reading is normal, distant transmitter is defective. If reading is not normal, trouble is in receive converter or receive frequency synthesizer; refer to paragraphs 27 and 30.

19. Receiver Trouble Sectionalization Chart (Diversity Operation, Battalion Terminal)

At the battalion terminal where two complete radio sets are used, one radio set is designated as the control and the other is designated as the slave (TM 11-5820-469-10). To sectionalize defects in the receiver used in the control radio set, perform the procedures given in items 1, 2, 3 and 4 of the chart in paragraph 18. Perform item 5 only if items 1, 2, 3 and 4 indicate the need. In item 5 be sure to check the synthesizer that is being used with the receive converter in the control set. To sectionalize defects in the receiver used in the slave radio set, perform the following procedure:

Item No.	Sectionalization procedure	Normal indication	Corrective measure or reference
1	On if. amplifier associated with slave receive converter, set switch S1 on 8-mc if. No. 2 subchassis to RCVR GAIN 6 position.	Meter M1 on 8-mc if. No. 2 indicates reading of 6.	Proceed to item 2.
2	On the receive 0-1462A/TRC synthesizers (top and bottom) of rack A3, check the OUT OF LOCK indicator and the TUNING VOLTAGE meter.	OUT OF LOCK indicator should be off, and TUNING VOLTAGE meter indicator should be approximately midscale.	If no indication is obtained the 0-1462A/TRC synthesizer is probably defective. If the indications in this procedure are normal but no indication was obtained in item 1 (above), perform procedures in items 3 through 5 below.
3	At switch panel, disconnect REMOTE end of OUT NO. 2 coaxial patch cable (or OUT NO. 1, depending on which receiver converter is being used) and connect it to associated IF IN jack. On the associated if. amplifier, set switch S1 on the 8 MC IF NO. 2 subchassis to RCVR GAIN 6 position.	Meter M1 on 8 MC IF No. 2 indicates 6.	If no indication is obtained, trouble is in the receive converter, refer to para 30. If proper indication is obtained, trouble may be in if. amplifier in control radio set. Proceed to Item 4.
4	On receive converter in use, press TUNE-UP SIGNAL switch and repeat sectionalization procedure given in item 1 above.	Meter M1 on 8 MC IF NO. 2 subchassis indicates reading of no greater than 10.	If meter indication is normal, distant transmitter is defective. If reading is abnormal, refer to para 30.
5	On the switch panel, reconnect the coaxial patch cable to the REMOTE jack.	None.	None.

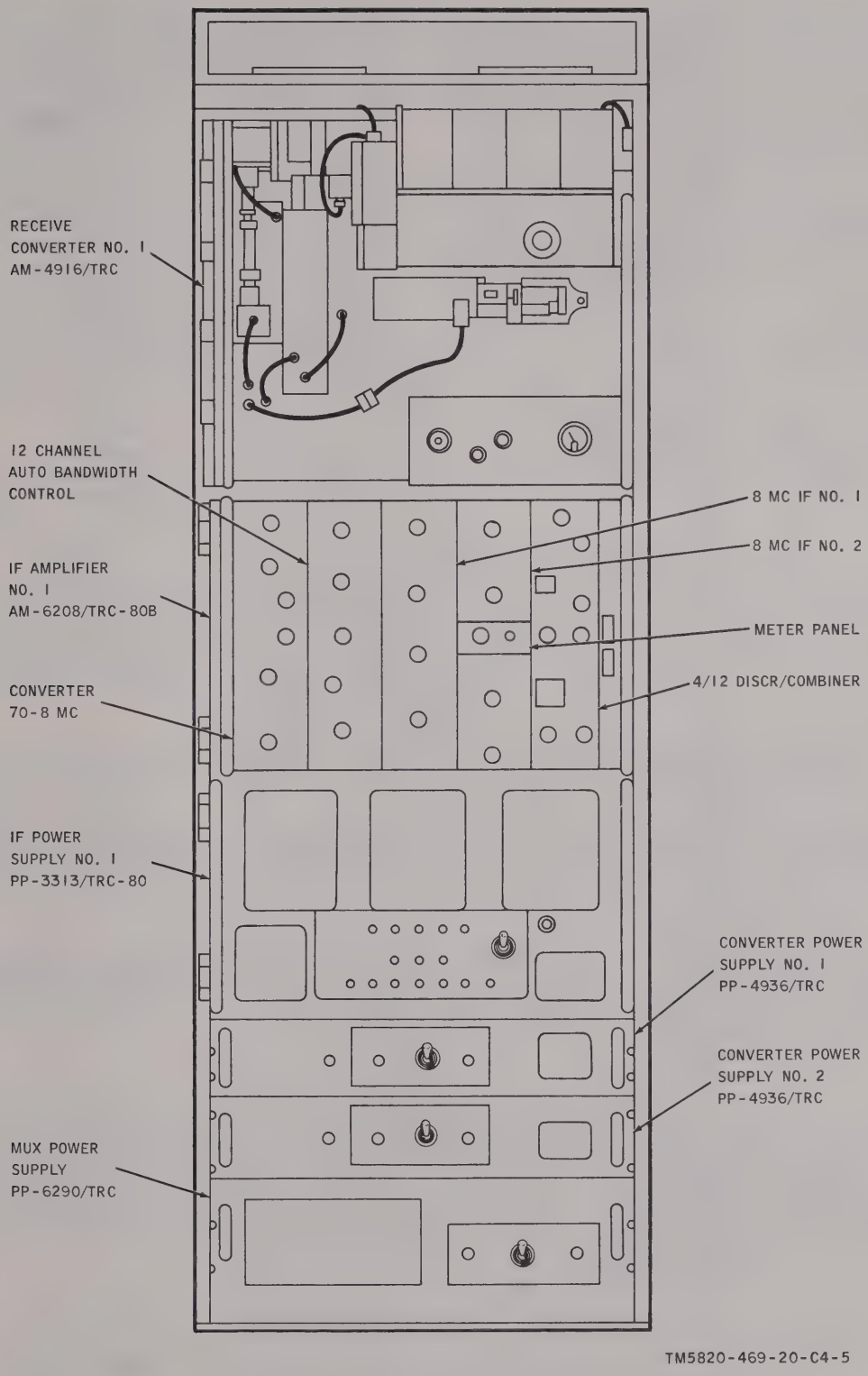


Figure 10. Rack A5, receiving equipment with covers removed.

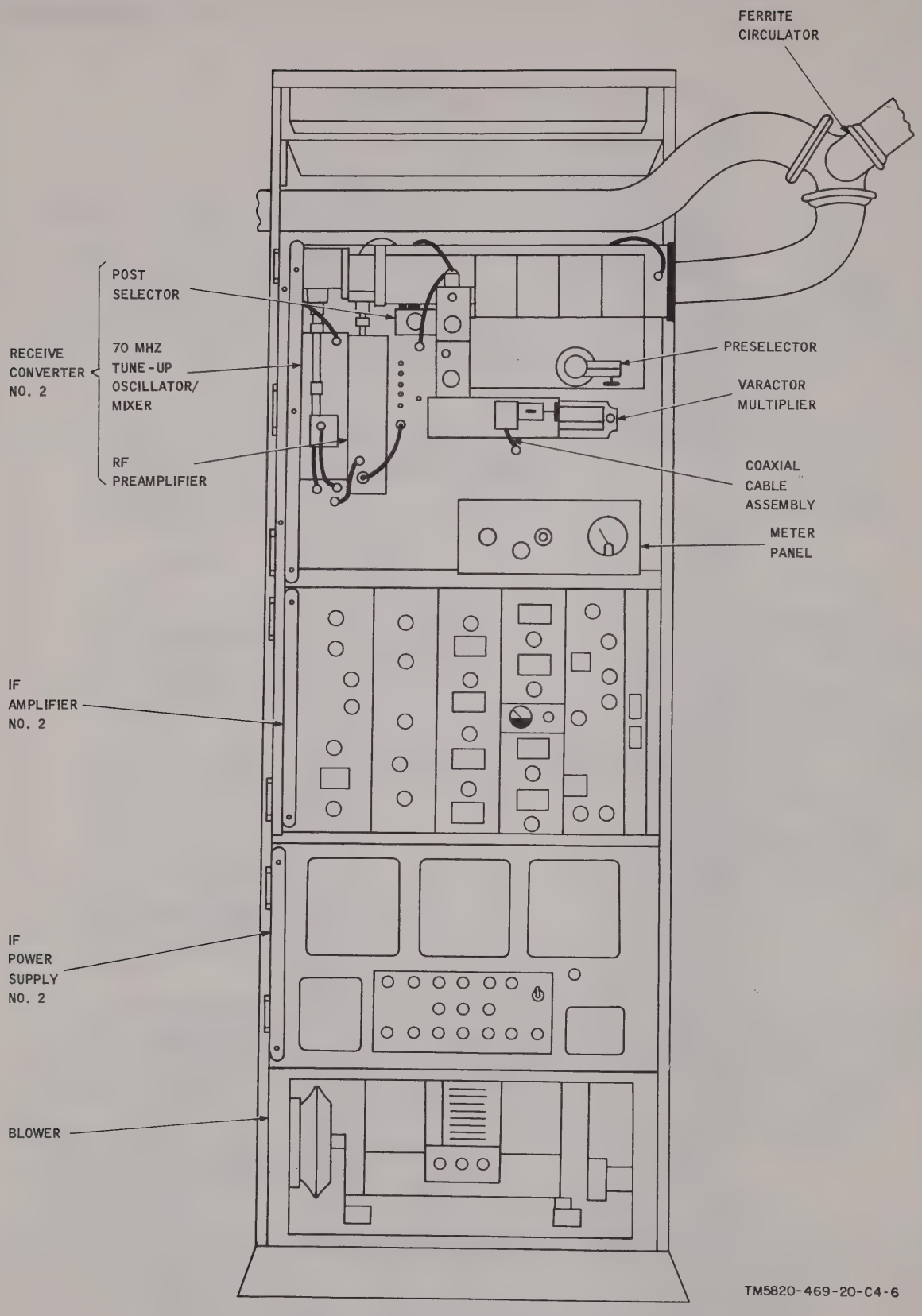


Figure 11. Rack A4, receiving equipment, with covers removed.

20. Sectionalizing Troubles with Monitor

It is often possible to sectionalize voice and teletypewriter signal troubles in the AN/TRC-80B to the telegraph terminal, telephone terminal, multiplexer, modulator-multiplier or if. amplifier in the receiver by using the monitor located in rack A1. The following chart lists steps to be taken in the sectionalizing of troubles by use of the monitor meter and test signals from the control panel and channel 2 signaling termination unit of the telephone terminal. For certain tests, the distant station is requested to send a test signal. If at any time during the tests no meter indication is obtained, check the associated interconnecting cabling (para 34 through 39) before taking any further corrective action. The *Corrective measures* column in the chart below lists minor adjustments that may be performed by the organizational repairman; however, the repairman should note any recurrent deviations from normal operating conditions and refer to higher category maintenance personnel as required.

Step	Action	Purpose of test	Normal indication	Corrective measures
	Note: Switch S1 of the monitor must remain in position A at all times. No teletypewriter or voice signals are to be applied except as specified.			
1	Set monitor switch S2 to F and press TONE TX pushbutton of the signal/termination unit for channel 2.	Adjusts the 1600 Hz test tone output level of the subgroup modulator.	SET POINT indication on monitor meter.	Adjust LEVEL control on the GROUP MOD unit for SET POINT indication on monitor meter.
2	Set monitor switch S2 to B and press control panel TEST SIGNAL pushbutton.	Adjust test signal level.	SET POINT indication on monitor meter.	Adjust TEST SIGNAL LEVEL control on control panel for SET POINT indication on monitor meter.
3	Set monitor switch S2 to C and press control panel TEST SIGNAL pushbutton.	Check multiplexer voice transmit channel.	SET POINT indication on monitor meter.	Adjust R29 (on multiplexer fig. 12) for SET POINT indication on monitor. Check V1 and V6 in multiplexer and power supply tubes V10, V11, and V12 (fig. 12).
4	Set monitor switch S2 to A, press control panel TEST SIGNAL pushbutton.	Check frequency deviation at output of modulator-multiplier.	SET POINT indication on monitor meter.	Adjust OW DEV R17 (fig. 14) on modulator-multiplier for SET POINT indication on monitor meter. Refer to modulator-multiplier troubleshooting chart (para 26).
5	Set monitor switch S2 to A and press TONE TX pushbutton of the signaling/termination unit for channel 2.	Check frequency deviation at output of modulator-multiplier.	SET POINT indication on monitor meter.	Adjust MUX DEV R106 (fig. 14) on modulator-multiplier for SET POINT indication on monitor meter. Refer to modulator-multiplier troubleshooting chart (para 26).

Step	Action	Purpose of test	Normal indication	Corrective Measures
6	Set the monitor switch S2 to E, turn if. power supply no. 1 to OFF. Ask the terminal to send test tone (by pressing TONE TX push-button of channel 2 signaling/termination unit.).	Check receiver no. 2 output to the telephone terminal.	SET POINT indication on monitor meter.	Adjust BASEBAND GAIN R33 (fig. 21) on if. amplifier no. 2.
7	Set the monitor switch S2 to E, turn the if. power supply no. 2 OFF. Ask the distant terminal to send test tone (by pressing TONE TX pushbutton of channel 2 signaling/termination unit.)	Check receiver no. 1 output to the telephone terminal.	SET POINT indication on monitor meter.	Adjust BASEBAND GAIN R33 (fig. 21) on if. amplifier no. 1.
8	Set the monitor switch S2 to D, turn if. power supply no. 2 to ON. Ask the distant terminal to send test signal (by pressing TEST SIGNAL pushbutton on the control panel.)	Check orderwire output of if.	SET POINT indication on monitor meter.	Adjust ORDERWIRE GAIN R52 (fig. 21) on if. amplifier no. 2.
9	Set monitor switch S2 to G and set telegraph terminal switches to SEND and 4W.	Check multiplexer teletypewriter transmit channel.	SET POINT indication on monitor meter.	Adjust R5 (fig. 12) for SET POINT indication on monitor meter. Check multiplexer tube V2.
10	Set monitor switch S2 to H. Ask distant terminal to transmit teletypewriter mark tone.	Check multiplexer teletypewriter receive channel.	SET POINT indication on monitor meter.	Adjust R41 (fig. 12) on multiplexer for SET POINT indication on monitor meter. Check multiplexer tubes V4 and V3.

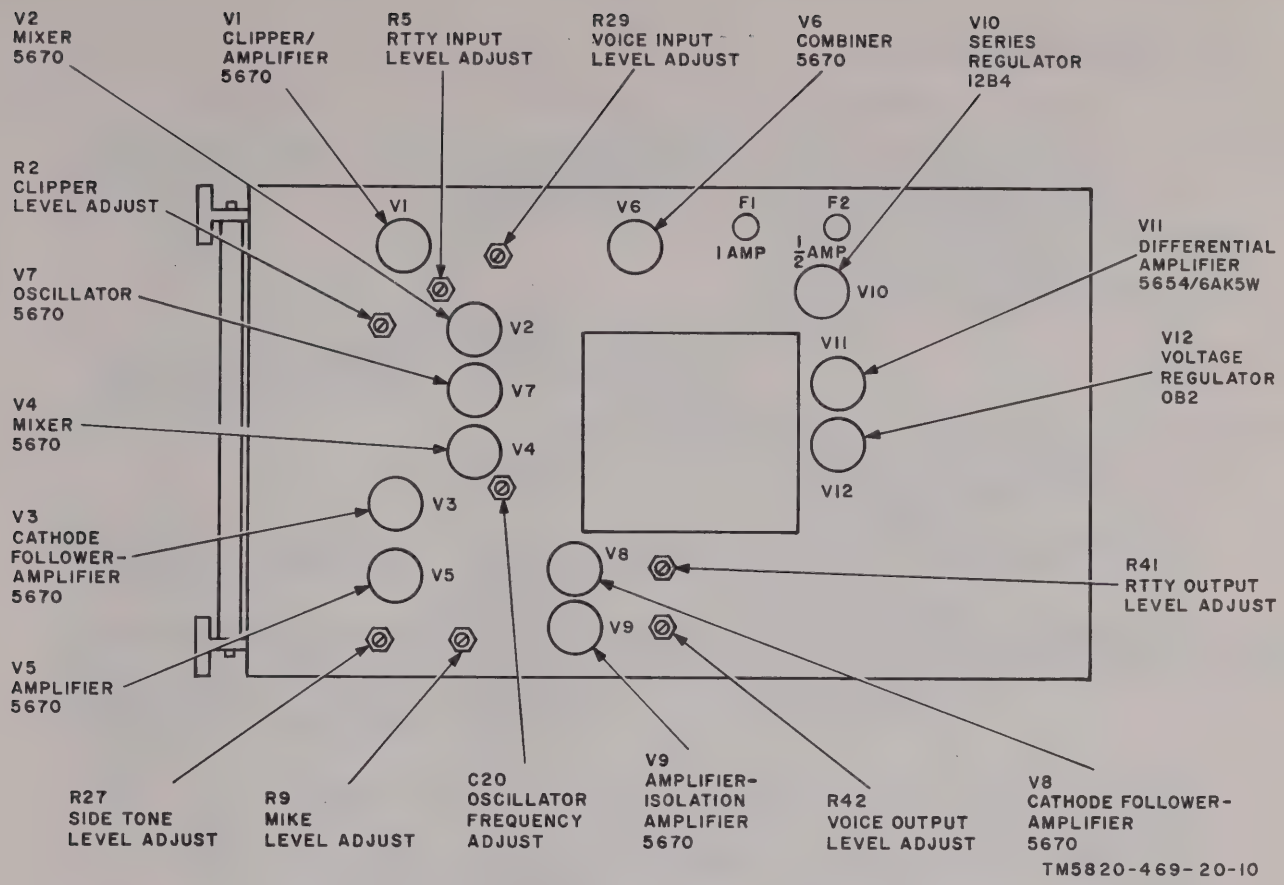


Figure 12. Multiplexer, tube location and adjustment points.

Section III. LOCALIZATION OF TROUBLES

21. General

The procedures in this section localize troubles with the units of the equipment groups (para 15) of the AN/TRC-80B. Most of the troubleshooting charts are based on abnormal front panel indications and abnormal meter readings. Troubleshooting of the multiplexer unit is performed as part of the sectionalization check by use of the monitor in rack A1 (para 20) and the operational trouble symptoms (para 22). References from the quarterly maintenance service and inspection chart (para 8) are made direct to the troubleshooting chart that pertains to the equipment unit being checked. When the corrective measures do not restore normal operation, or if no corrective measures are listed, repair by higher category of maintenance is required.

Note: The fuse and pilot lamp locations are illustrated in TM 11-5820-469-10.

22. Voice and Teletypewriter Channels Troubleshooting Chart

This troubleshooting chart localizes troubles to defective tubes and parts within the multiplexer unit and to units associated with the multiplexer.

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
1	Cannot receive teletypewriter signals. Transmission of teletype-	Defective V8, V4, V7, or V3. Defective teletype-	On monitor, set S2 to D. If monitor meter indication is 0, no teletype-

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
	writer and voice normal. Reception of voice normal.	writer equipment in distant station, or defective teletypewriter equipment in local station.	writer signal is being received; instruct distant station to check its teletypewriter transmit equipment. If meter indication on D is normal, set S2 to H. If indication on H is normal, check local teletypewriter equipment. If indication is 0, defect is in multiplexer. Check tubes V3, V8, V7, and V4.
2	Cannot transmit teletypewriter signals. Reception of teletypewriter and voice signals normal. Transmission of voice normal.	Defective V2,V3,V7 or,V6 in multiplexer. Defective local teletypewriter equipment. Defective teletypewriter equipment at distant station.	On monitor, set S2 to G. If meter indication is 0, check tubes V2,V6,V3,V7 of multiplexer. If indication is normal, have distant station check its teletypewriter receiving equipment.
3	Cannot receive voice signals at local headset or speaker. Other facilities normal.	Defective V5 or V8 in multiplexer, or defective cabling to control panel.	On monitor, set S2 to D If indication is normal, check V8 and V5 in multiplexer and cabling connections.
4	Cannot transmit voice from control panel microphone -headset. Other facilities normal.	Defective V6 or V1 in multiplexer. Defective cabling between control panel and multiplexer.	On monitor, set S2 to B. If indication is normal, check tubes V1 and V6 in multiplexer. If indication is 0,check cabling (para 34).
5	Cannot receive or transmit teletypewriter signals. Other facilities normal.	Defective V3 or V7 in multiplexer unit.	Check V3 and V7.

Note: The multiplexer units local mike input (J11-A and D) and local headset phone output (J11-D and E) are not used in the Pershing Weapons System. (Wiring is extended from the multiplexer to rack A1A1TB3). Steps 6 and 8 are not normally applicable.

6	Cannot transmit from local microphone. No local sidetone. Other facilities normal.	Defective microphone or defective V9 in multiplexer unit.	Check microphone by substitution. Replace V9.
7	Cannot transmit or receive voice or teletypewriter signals.	Defect in multiplexer ac input circuit or dc power supply.	If FILAMENT indicator lamp is out, check fuse F1. If FILAMENT indicator lamp is lighted but TIME DELAY and B+ indicator lamps do not light, check fuse F2 and tubes V10, V11, and V12 in multiplexer.
8	Low audio level for sidetone on local headset.	Level adjust sidetone R27 turned down too low. Defective V9.	Adjust R27 (fig. 12) for comfortable audio level. Check tube V9.

23. Primary Power Troubleshooting Chart

This troubleshooting chart localizes defects to improperly set controls on the engine-generator control panel, the engine control starting panel, and to minor defects in the engine generator. Defects pertaining to the engine generator and the associated starting panel are covered in *a* below. Troubles in the engine-generator control panel are localized in the procedures in *b* below. Repairs on the engine generator are performed by higher category maintenance personnel.

a. Engine Generator and Engine Control Starting Panel Troubleshooting Chart (fig. 11 and 36, TM 11-5820-469-10).

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
1	Engine generator does not start when ENGINE CONTROL start switch is held at START.	*a.* EMERGENCY ENGINE SHUTDOWN switch on engine generator control panel is set at STOP. *b.* Defective battery -------	*a.* Set EMERGENCY ENGINE SHUTDOWN switch to RUN. *b.* Higher category maintenance required.

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
2	OIL PRESSURE indicator on engine control starting panel lights.	Low oil pressure----------	Turn ENGINE CONTROL switch to OFF. Check for oil leaks and for proper oil level. If oil level is normal, higher category maintenance is required. *Caution:* Turn off the engine generator immediately when OIL PRESSURE on engine control starting panel lights.

b. Engine-Generator Control Panel Troubleshooting Chart.

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
1	Ammeter indicates battery is discharging.	Defective battery to engine-generator connection.	Check connection.
2	Hourmeter on engine generator control panel not running.	Defect in clock mechanism or internal connection.	Higher category maintenance required.
3	Voltmeter indicates above or below 208-volt setting.	VOLTAGE CONTROL rheostat incorrectly set.	Adjust VOLTAGE CONTROL rheostat for 208-volt voltmeter indication.
4	Frequency meter indicates above or below 400 cycles-per-second setting.	FREQUENCY CONTROL switch incorrectly set.	Operate FREQUENCY CONTROL switch to RAISE or LOWER position until frequency meter indicates 400 cps. *Caution:* If frequent corrections are necessary, higher category maintenance is required.
5	HEAD TEMPERATURE indicator lights.	Engine generator cooling system defective.	Higher category maintenance required.

24. Power Distribution Panel SB-1565/ TRC-80 Troubleshooting Chart

Most of the trouble symptoms (blown-fuse indicators and pilot lamps) on this switch panel indicate that trouble exists in other units of the AN/TRC-80B. For example, when one of the AIR FAILURES indicators lights, defective blower operation has occurred in one of the equipment racks. Similarly, when the FLUSHING BLOWER fuse opens and fuse replacement does not correct the trouble, the defect will generally be located in the flushing blower circuit and not within the switch panel.

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
1	Hut lights are on, but HUT LIGHTS indicator lamp is out.	Defective pilot lamp ------	Replace pilot lamp (TM 11-5820-469-10).
2	One of FUSES indicators lights----	Open fuse ----------	Replace defective fuse (TM 11-5820-469-10).
3	FLUSHING BLOWER indicator lamp goes out.	Open FLUSHING BLOWER fuse, FLUSHING BLOWER circuit breaker on circuit breaker panel tripped, defective pilot lamp, or trouble in flushing blower circuit.	Check FLUSHING BLOWER FUSE and indicator lamp. Reset FLUSHING BLOWER circuit breaker. Higher category maintenance required if circuit breaker trips again.
4	RACK BLOWERS indicator lamp goes out but AIR FAILURES indicator lamps are not lighted.	Defective pilot lamp ------	Replace pilot lamp.
5	AIR FAILURES RACK 1 indicator lamp lights.	Open fuse in rack A1 blower circuit.	Check F1 and F2 in rack A1.
6	no longer used		

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
7	AIR FAILURES RACK 4 & 5 indicator lamp lights.	Open fuse in rack A4 blower circuit.	Check F1 and F2 in rack A4.
8	RACK power indicator lamp goes out.	Defective pilot lamp. RACK POWER circuit breaker on circuit panel tripped off.	Replace pilot lamp. Check RACK POWER circuit breaker on circuit breaker panel. If circuit breaker trips after resetting, higher category maintenance is required.

25. Monitor Troubleshooting Chart (fig. 13)

The monitor is used to visually check incoming and outgoing voice and teletypewriter signals. When the overall equipment appears to be working normally but indications on the monitor are abnormal, a defect may exist within the monitor. The chart below lists the trouble symptoms and the recommended corrective measures for a defective monitor. To gain access to the pluckout components within the monitor, refer to paragraph 40.

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
1	Power indicator does not light when PWR switch is set to ON.	*a.* Defective fuse F1 ------ *b.* No connection to 120-volt ac line at TB1 (rear of monitor chassis).	*a.* Replace F1. *b.* Check connections to terminals 1 and 2 of TB1 (fig. 22).
2	Pilot lamp is on, but no meter indications on any switch position.	Defect in monitor dc power supply.	Check V7, V8, and V9 (fig. 13).
3	Normal meter indications on all switch positions except A of S2.	*a.* No connection, or poor connection, to J8 on rear panel of monitor. *b.* Defective V1, V2, V3, V4, or V5.	*a.* Check connection to J8 (fig. 22). *b.* Check V1, V2, V3, V4 and V5 (fig. 13).
4	No reading, or inconsistent meter readings, on all positions of S2.	Defect in V5, V6, or V7 ---	Check V5, V6, and V7 (fig. 13).
5	No meter indication on just one position of S2 (rest of AN/TRC-80B equipment operating normally).	Open coaxial connection to one of rear panel jacks.	Check connections to jacks J1 through J8 (fig. 22 and para 35*b*).

26. Modulator-Multiplier Troubleshooting Chart (fig. 14)

When the multiplexer and/or the telephone terminal units are functioning normally but no modulated 70-MHz signal from the modulator-multiplier is being applied to the transmit converter, the trouble is probably located in the modulator-multiplier. The chart below lists the trouble symptoms and recommended corrective measures for a defective modulator-multiplier.

Item No.	Trouble symptom	Probable trouble	Checks and correction measures
1	FIL indicator does not light when POWER switch is turned on.	Open F1 (fig. 20, TM 11-5820-469-10). Defective connection to TB1.	Replace F1. Turn off power and check connection to TB1 (fig. 24).
2	FIL indicator is lighted but TIME DELAY and B+ indicators are not lighted.	Blown fuse in dc power supply	Check B+ fuse F2. Check PWR SUPPLY fuse F3.
3	Only order-wire transmission possible.	*a.* Defective V17 or V18. Poor connection to J9 or coaxial tie.	*a.* Check V17 or V18. Check connection on rear panel to J9 or coaxial tie.

Item No.	Trouble symptom	Probable trouble	Checks and correction measures
		b. Defect in telephone terminal output circuit or cabling.	b. On monitor, set S2 to F. If indication is normal and V17 and V18 have been checked, higher category repair is required. If meter indication is 0 with the TONE TX pushbutton of channel 2 signaling/termination unit pressed, check looping plug between MOD OUT jack J5 and TX LINE J6 on telephone terminal jackfield. Check connections of cables W19 and W61 at coaxial tee or the rear panel to J9 (fig. 24) and J302 on telephone terminal. If trouble is not located, higher category repair is required.
4	No order-wire transmission possible. Other transmission facilities normal.	Defective connection to OW INPUT connector J8.	Check connection to J8 (fig. 24).
5	No transmission possible; multiplex unit (para 20 and 22) checks normal.	a. Defective tube in modulator-multiplier. b. Defect in transistorized power supply.	a. Check V1 through V16. b. Higher category repair required.

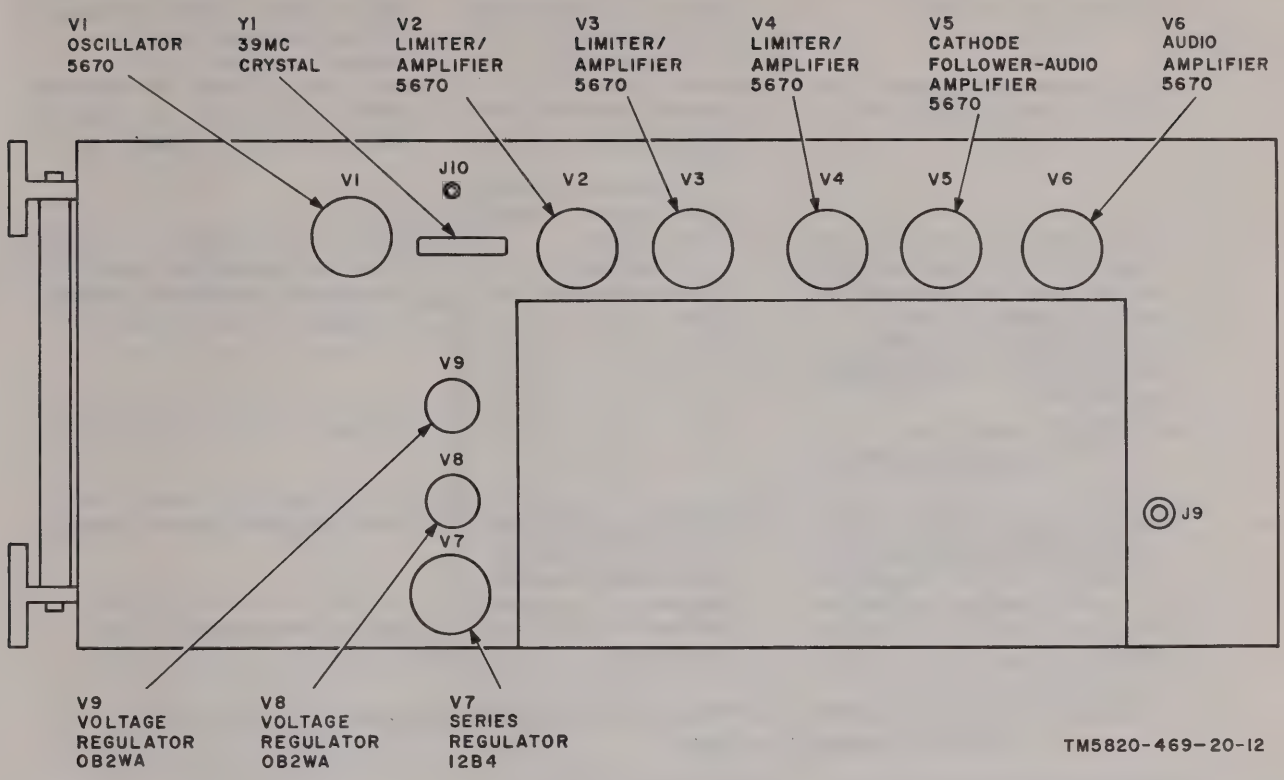


Figure 13. Monitor, tube and crystal location diagram.

27. Synthesizer Troubleshooting Chart

Three synthesizer units are used in the AN/TRC–80B equipment. A 1,082.5- to 1,232.4875-MHz signal supplied by the synthesizer is applied to the varactor multiplier units of the transmit and receive converters. When all other indications appear normal but no output is obtained from the transmit converter or the receive converter, check the synthesizer that supplies the conversion frequency to the converter being checked. The synthesizer is not repairable at organizational level. Refer defective synthesizer to a higher category for repair. The troubleshooting chart applies to all synthesizers.

Item No.	*Trouble symptom*	*Probable trouble*	*Checks and corrective measures*
1	POWER indicator lamp does not light when POWER is set to ON.	*a.* Defective pilot lamp or fuse.	*a.* Check fuse F1 on power panel. Check POWER indicator lamp on fault panel.
		b. Power supply has not recovered from overload cutoff.	*b.* Deenergize and reenergize POWER ON switch.
2	OUT OF LOCK indicator lamp flashing.	Incorrect output frequency.	Rotate MHZ frequency knob to appropriate frequency settin of MEGAHERTZ switches. Adjust until OUT OF LOCK indicator stops flashing and TUNING VOLTAGE indicator is at midscale

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
1	With POWER switch at ON, FIL indicator fails to light.	Open fuse F1, defective indicator, or poor connection to terminals 1 and 2 of TB1 (fig. 23).	Turn off power. Check F1 and FIL indicator lamp. Check connection on TB1 on rear panel of transmit converter.
2	After 3 minutes of operation, TIME DELAY lamp does not light.	Defective TIME DELAY indicator, defective time delay relay K3, no connection to terminals 3 and 4 of TB1, open fuse F3.	Check TIME DELAY indicator lamp. Check K3 by replacement. Check connections on TB1. Check F3.
3	With meter function switch in position G or H, no peak indication on the panel when POWER OUTPUT control on the synthesizer or controls G and H on the varactor multiplier are adjusted. **Note.** Item 4 applies to transmit converters equipped with HA-35N-type traveling wave tube only.	*a.* No input from synthesizer. *b.* Defective varactor multiplier.	*a.* Refer to paragraph 27. Check input cable connections (para 35*c*). *b.* Maintenance at a higher category is required.
4	With meter function selector switch set to HELIX and BEAM PUSH TO START button pressed, the meter should indicate less than 80 (normally 20 to 25). BEAM lamp should light.	*a.* Defective regulator tube V1 or differential amplifier tube V2 on main chassis. *b.* Defective BEAM indicator lamp.	*a.* Check V1 and V2 on main chassis. *b.* Replace BEAM indicator lamp.
	Note. Item 5 applies to transmit converters equipped with EM1167C traveling wave tube only.		
5	With meter function selector switch set to COLLECTOR, meter indication is less than 80 or greater than 100 when BEAM PUSH TO START pushbutton is pressed. BEAM lamp should light.	a. Defective regulator tube V1 or differential amplifier tube V2 on main chassis. b. Defective BEAM indicator lamp.	a. Check V1 and V2 on main chassis. b. Replace BEAM indicator lamp.
6	With meter function selector switch set to OUTPUT, meter indication is less than 40.	TUNABLE FIL control not adjusted correctly. Defective travelling wave tube V9.	Readjust TUNABLE FIL control (TM 11-5820-469-10). If adjustment does not restore meter reading to 40, higher category repair is required.
7	With meter function selector switch set to OUTPUT, there is a meter indication when CARRIER SWITCH on modulator-multiplier is pressed.	TUNABLE FIL control is set to carrier frequency.	Release CARRIER SWITCH, and adjust TUNABLE FIL control for peak indication on 70 MHz higher frequency.

29. Power Amplifier Troubleshooting Chart (fig. 18)

When the transmit converter is supplying a normal input driving signal (para 28) but meter indications on the pa are abnormal, the defect is probably in the pa stage or the associated power supply circuits. The power amplifier tuning procedure is presented in TM 11-5820-469-10. When the trouble symptom is not known, perform each step in the tuning procedure until an indication of improper operation is observed. If the trouble symptom is known, refer directly to the appropriate trouble symptom (below) and perform the recommended checks and corrective measures.

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
1	FILAMENT switch is set to ON but klystron blower does not start.	Control panel drawer improperly seated. BLOWER circuit breaker not on.	Check control panel drawer for proper seating. Check BLOWER circuit breaker.
2	AIR and FILAMENT indicators not lighted.	Open F102, or klystron drawer improperly seated.	Check F102. Check klystron drawer for proper seating.
3	FILAMENT VOLTAGE meter does not indicate 6.5 volts.	FILAMENT ADJUST control improperly set.	Adjust FILAMENT ADJUST control for 6.5-volt meter indication. Higher category maintenance is required.
4	After 3 minutes of operation, TIME DELAY indicator does not light.	Defective relay amplifier tube.	Check tubes V101, V102, and V105 in control panel.
5	BEAM CURRENT meter indicates less than 450.	Klystron cavity controls improperly tuned.	Refer to tuning procedure (TM 11-5820-469-10), and retune klystron.
6	No reading on POWER IN meter when REFLECTED-INCIDENT switch is set to INCIDENT.	No input from transmit-converter.	Refer to paragraph 28.
7	With REFLECTED-INCIDENT switch at INCIDENT, POWER IN meter does not indicate 100 milliwatts.	DRIVE LEVEL control (on klystron panel) incorrectly set.	Adjust DRIVE LEVEL control for indication of 100 on POWER IN meter.
8	ALARM indicator lights and alarm buzzer sounds.	*a.* Drive signal from transmit converter low, or klystron cavities incorrectly tuned.	*a.* Check transmit converter (para 28). Check klystron cavity tuning (TM 11-5820-469-10) for less than .08 REFLECTED KW and more than .8 INCIDENT KW indications on POWER OUT meter.
		b. Transmitter antenna connection improperly made.	*b.* Turn off power amplifier. Check antenna connection at OUTPUT connector (fig. 31) and XMTR ANT CONNECT connector (fig. 12, TM 11-5820-469-10) on top of shelter roof.

30. Receive Converter and Converter Power Supply Troubleshooting Chart

(fig. 19.1)

a. Receive Converter Troubleshooting Chart.

The receive converter accepts two input signals; a 4,400.00- to 4,995.95-MHz modulated signal from the distant AN/TRC-80 B, and a 1,082.5- to 1,232.4875-MHz signal from the synthesizer used with the receive converter. The output signal of the receive converter is a 70-MHz signal that is applied to the if. amplifier unit. To determine if the defect is in the receive converter or in another receiver unit, set the METER FUNCTION SELECTOR switch to the J-TUN. DET. position and press the TUNE-UP SIGNAL button. If an indication of 50 is obtained on the panel meter, the trouble is probably external to the receive converter. If no meter indication is obtained, check the tuneup oscillator/mixer (fig. 19.). Retune the receive converter as directed in the tuning procedure (TM 11-5820-469-10) until an abnormal indication is obtained. Refer to the trouble symptom that corresponds to the abnormal indication, and perform the recommended checks and corrective measures.

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
1	No meter indications	Defective power input connection. Defect in converter power supply.	Check power connections (fig. 29). Check converter power supply (*b* below).
2	No peak meter indication on meter when control G on varactor multiplier is adjusted.	Defect in varactor multiplier circuit.	Higher category repair required.
3	Meter indication excessive when METER FUNCTION SELECTOR switch is set at H-XTAL CUR.	Excessive input power from synthesizer.	Reset synthesizer POWER OUTPUT control.
4	Meter does not indicate at SET POINT when METER FUNCTION SELECTOR switch is set at H-XTAL CUR.	a. Varactor multiplier improperly tuned. b. (No synthesizer input, synthesizer POWER OUTPUT control incorrectly set.)	a. Check varactor multiplier tuning. b. (Adjust synthesizer POWER OUTPUT control for SET POINT indication.)
5	Meter does not indicate 50 when METER FUNCTION SELECTOR switch is set to J-TUN. DET. and TUNE-UP SIGNAL button is pressed.	a. Preselector and or postselector are tuned incorrectly. b. (Defective if. amplifier).	a. Check tuning of preselector and postselector (TM 11-5820-469-10). b. Check if. amplifier (para 32).

b. Converter Power Supply Troubleshooting Chart. The converter power supply provides the B+ requirements of the receive converter (*a* above).

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
1	Power switch set to ON but POWER indicator does not light.	a. Defective fuse or pilot lamp. b. Poor or defective connection at rear panel connector J4.	a. Check fuses F1. Check POWER indicator lamp. b. Check connector J4 on rear panel of converter power supply.

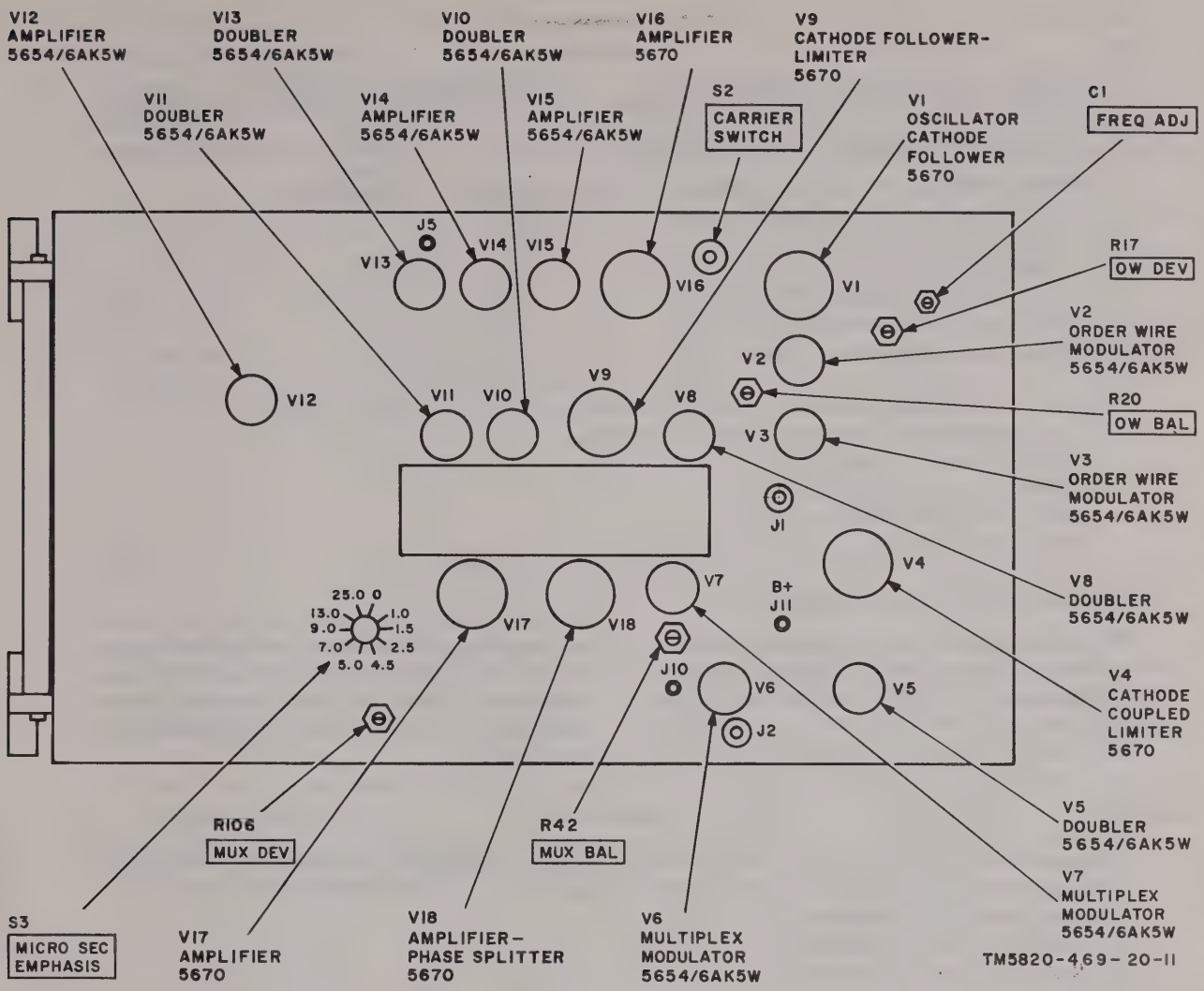


Figure 14. Modulator-multiplier, location of tubes and adjustment points.

31. If. Power Supply Troubleshooting Chart

The if. power supply contains three transistorized 200-volt power supplies, A1 through A3. These supplies are not stocked at organizational levels and must be replaced by higher echelon maintenance. The organizational maintenance repair of the if. power supply is limited to checking of fuses, pilot lamps, and rear panel connector J5. The fuse and panel lamp location diagram is illustrated in figure 29 of TM 11-5820-469-10.

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
1	POWER switch is set to ON but POWER indicator is not lighted.	Defective fuse or lamp. Poor connection at J5 on rear panel of if. power supply.	Check F1 and POWER indicator lamp. See that P3 is properly inserted in J5 on rear panel of if. power supply.
2	TIME DELAY indicator lamp does not light 30 seconds after POWER switch is set to ON.	Defective fuse or lamp --------- Defective time delay relay K1 ---	Check F2 and TIME DELAY indicator lamp. Higher echelon required.
3	Indicator A1 does not light -------	Defective fuse or lamp ---------	Check F4 and F8. Check indicator lamp.

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
4	Indicator A2 does not light	Defective fuse or lamp	Check F5 and F9. Check indicator lamp.
5	Indicator A3 does not light	Defective fuse or lamp	Check F6 and F10. Check indicator lamp.
6	Tubes V2,V3, and V4 in 4/12 channel discriminator combiner subchassis of if. amplifier do not light (fig. 21). Other subchassis filaments normal.	No.-6.3-volt dc filament power.	Check fuse F7.
7	All tube filaments are out except in tubes V2,V3, and V4 in 4/12 channel discriminator combiner subchassis of if. amplifier.	No 6.3-volt ac filament power.	Check fuse F3.

32. If. Amplifier Troubleshooting Chart

The if. amplifier unit contains the five subchassis illustrated in figure 10 and 21. Troubleshooting of the if. amplifier at the organizational level is confined to the use of the monitor meter (located in rack A1) and the meter on the 8-mc if. No. 2 subchassis to localize defects to a subchassis. When tube replacement and an interchassis connector check do not restore normal operation, higher echelon maintenance is required.

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
1	Filament in tubes V2,V3,and V4 in the 4/12 channel discriminator combiner subchassis not lighted. Other subchassis tube filaments normal.	No.-6.3-volt dc input from if. power supply.	Refer to item 6 of if. power supply troubleshooting chart (para 31).
2	All subchassis filaments are out except tubes V2,V3, and V4 in the 4/12 channel discriminator combiner.	No 6.3-volt ac input from if. power supply.	Refer to item 7 of if. power supply troubleshooting chart (para 31).
3	No receiver output. (No meter indication on the monitor meter when selector switch S2 is set to D or E.)	a. No 70-MHz signal input from the receive converter.	a. Check connection to J1 (fig. 30) on rear panel of if. amplifier chassis. Refer to figure 39; paragraphs 35, 36, 38 and 39; and check subchassis cable connections.
		b. Defective tube in one of the if. stages.	b. Push TUNE-UP SIGNAL button on receive converter and check for deflection of if. amplifier meter with switch S1 at REC GAIN 6.

28. Transmit Converter Troubleshooting Chart

(figs. 9 and 16)

Two input signals are applied to the transmit converter. One signal is the 70-mc signal from V16 in the modulator-multiplier, applied to filter FL2. The other signal is a 1,082.5- to 1,232.4875-MHz signal from the synthesizer to the varactor multiplier. The output signal of the transmit converter is a 4,400.00-to 4,999.95-MHz signal that is applied to the klystron unit in the power amplifier. When both the modulator-multiplier and the synthesizer inputs are normal (para 26 and 27) but there is no indication on the POWER IN meter of the power amplifier, the trouble is in the transmit converter or the cabling. The chart below lists the symptoms and the recommended corrective measures for a defective transmit converter.

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
			If deflection is normal, trouble is probably in the 4/12 channel discriminator combiner subchassis. Check tubes. If there is no deflection, check tubes in the converter, the 12 channel auto bandwidth control, the 8-mc IF No. 1, and the 8-mc IF No. 2.

32.1 Telephone Terminal and Mux Power Supply Troubleshooting Chart

The telephone terminal unit contains seventeen modules and a jackfield. The indicator fuses and control locations are illustrated in figure 27.1 of TM 11–5820–469–10. Troubleshooting procedure for the telephone terminal at the organizational level is confined to the use of the monitor meter (located in rack A1). When fuse replacement and the interchassis connector check do not restore normal operation, higher category maintenance is required.

a. Telephone Terminal Troubleshooting Chart.

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
1	None of the external telephone terminal subscirbers can receive voice frequency siginals. Transmission of voice frequency signals is normal.	Defective patching or cabling connection.	On monitor, set S2 to E. If indicatioin is normal, check RX LINE to DEMOD IN looping plug and cabling connections. If meter indication is 0 with distant terminal sending test tone (steps 6 and 7) refer to a higher maintenance category.
2	None of the external telephone terminal subscribers can transmit voice frequency signals. Reception of voice frequency signals is normal.	Defective cabling or patching connections.	On monitor, set S2 to F. If indication is normal, check coaxial tee connector on jack J9 (fig. 24) of modulator-multiplier. If indication is 0 with signaling/termination unit (channel 2) TONE TX pushbutton pressed, check MOD OUT to TX LINE looping plug and cabling connections.
3	No reception or transmission of any telephone terminal voice	*a.* Blown fuse in dc power supply or power regulator.	*a.* Check fuse F1 in mux power supply (rack A1). Check FUSE ALARM fuse in power regulator.
		b. Defective connection.	*b.* Check cabling connections.
4	No signaling to distant terminal or local subscriber. Reception and transmission of voice frequency signals normal.	Blown fuse in the oscillator.	Check fuse F1 (FUSE ALARM) in oscillator.

Figure 15. Deleted.

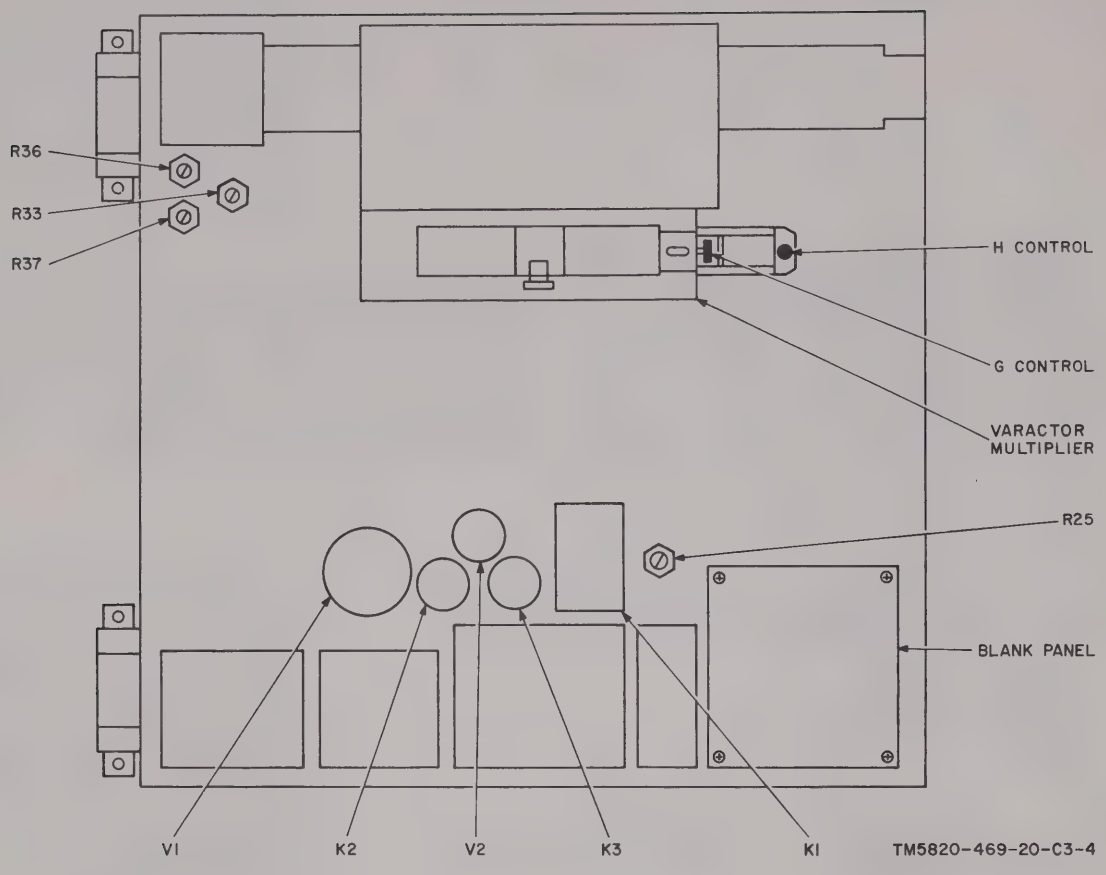


Figure 16. Transmit-Converter, component location.

Figure 17. Deleted.

33. Communication Facilities Troubleshooting Chart

All radio and landline communications to and from the AN/TRC–80B, with the exception of the four telephone terminal landlines, are controlled from the control panel. Troubleshooting of this unit, with the exception of checking cable connections to the control panel and replacing lamps, is performed by higher category maintenance. Sequence No. 27 through 35 of the quarterly maintenance checks and services chart (para 8) check the various communication facilities of the AN/TRC–80B. The chart below lists the corrective measures to perform when trouble develops.

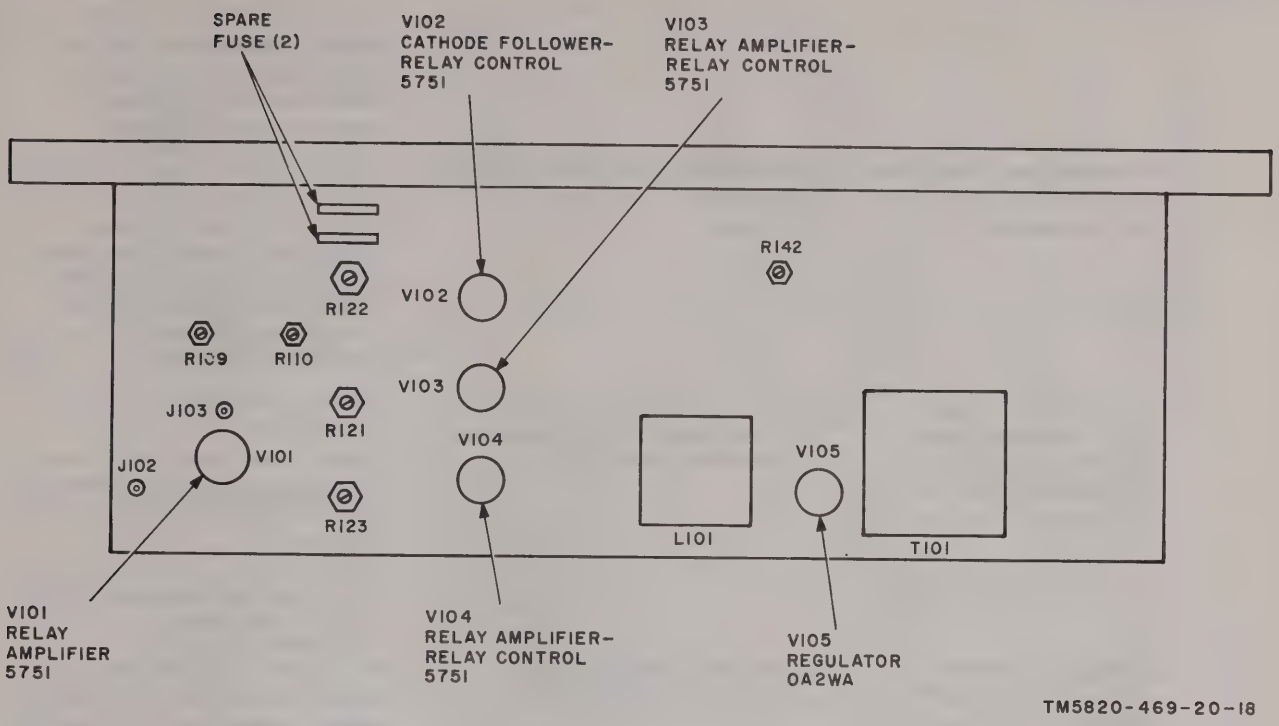


Figure 18. Power amplifier control panel, top view, location of tubes and adjustment points.

Item No.	*Trouble symptom*	*Probable trouble*	*Checks and corrective measures*
1	Communication difficulty on radio circuit (weak reception or poor transmission).	Transmitter or receiver requires adjustment.	Check transmit circuits: *a.* Push TEST SIGNAL pushbutton on control panel and check for SET POINT indication on monitor with switch S2 in position A. *b.* Set REFLECTED INCIDENT switch to INCIDENT and check pa POWER OUT meter for normal indication (greater than 0.8 kw). If indication (greater than 0.8 kw, refer to TM 11–5820–469–10 and retune power amplifier. Check receive circuits: *a.* Push TUNE-UP SIGNAL button on receive converter and check for full deflection of if. amplifier meter with switch S1 at RCVR GAIN 6. *b.* Place receive converter METER FUNCTION SELECTOR switch to J-TUN. DET. *c.* Push TUNE-UP SIGNAL button and check for sharp increase in meter indication. If

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
			normal indications are not obtained, refer to TM 11–5820–469–10 and retune receive section of AN/TRC–80B.
2	Pts speech and radio teletype writer communication 80B not possible.	AN/TRC–80B not tuned correctly, or equipment connections incorrect.	*a.* Check transmit and receive circuits as in item 1 above. *b.* Check cable connections at power and signal entry panel (fig. 33, TM 11–5820–469–10) PROGRAMMER TEST STATION jack J3 and TTY (PTS) jacks and J31 and J32.
3	Tree-party dc teletypewriter communication between pts, Army, and AN/TRC–80B operator not possible.	Defective TH–5A/TG, TH–22/TG, or teletypewriter, or equipment is connected incorrectly.	*a.* Check TH–5A/TG (TM 11–5805–365–12). *b.* Check pts cable and army 2-wire connections at power and signal entry panel jacks J3, J25, and J26. *c.* Check TTY (PTS) jacks J31 J32. Check teletypewriter circuits (TM 11–5815–206–12).
4	Speech communication with Army on 2W/4W telephone circuit not possible.	Poor or wrong connection in power and signal entry panel.	Check 2-wire (or 4-wire) telephone connections to power and signal entry panel jacks J17, J18, J19, and J20.
5	Teletypewriter communication with Army on vf teletypewriter circuit not possible.	Defective TH–5A/TG, TH–22/TG, or teletypewriter, or equipment is connected incorrectly.	*a.* Check TH–5A/TG (TM 11–5805–246–20) or TH–22/TG (TM 11–5805–365–12). *b.* Check teletypewriter circuits (TM 11–5815–206–12). *c.* Check 2-wire (or 4-wire) teletypewriter connections to power and signal panel jacks J23, J24, J25, and J26.
6	Speech communication with pts not possible.	Poor or wrong connection on power and signal entry panel.	*a.* Check connections to DISCRETE (PTS) jacks J27 and J28. and signal entry panel PROGRAMMER TEST STATION jack J3.
7	Speech communication with vehicular raidio circuit not possible.	Poor or wrong connection on power and signal entry panel.	Check connections to INTERCOM (PTS) jacks J29 and J30 on power and signal entry panel.
8	Speech communications with vehicular radio circuit not possible.	Defect in radio equipment used with vehicle, or poor or wrong connection on power and signal entry panel.	Check radio equipment associated with vehicle. Check connections to J7 on power and signal entry panel.

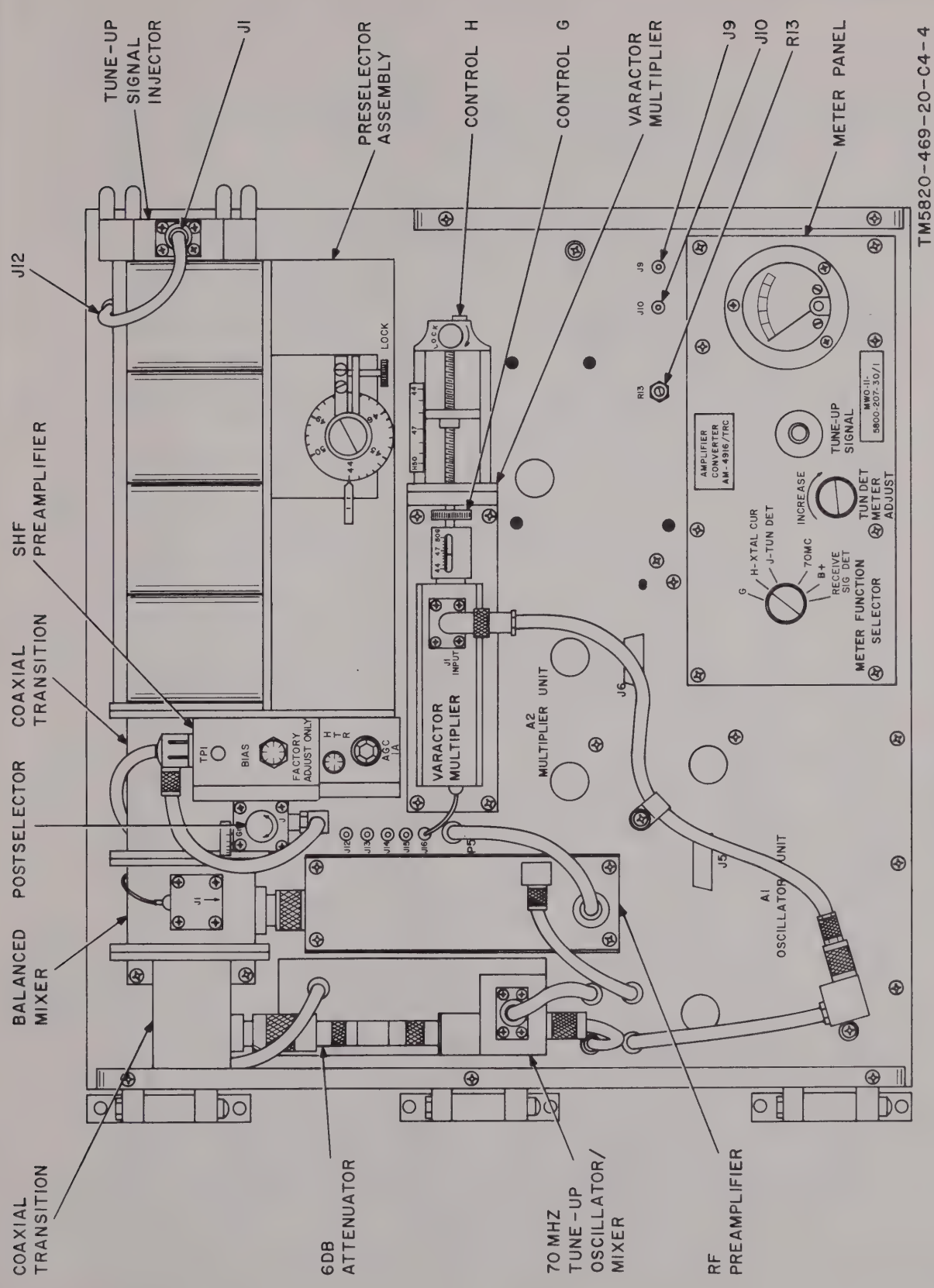


Figure 19. Receive converter, component location.

Figure 20. Deleted.

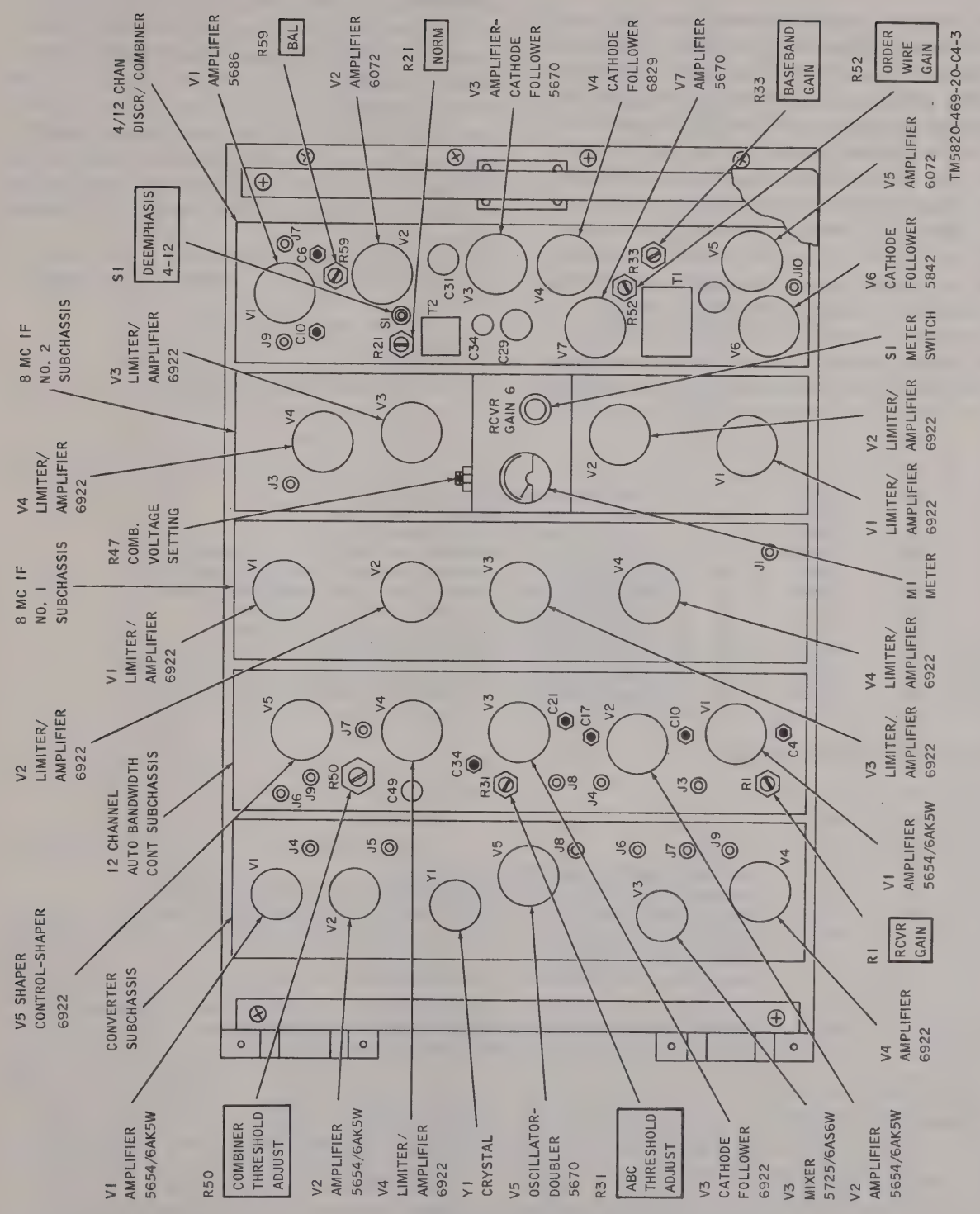


Figure 21. IF amplifier, location of subchassis, tubes and test points.

Section IV. COAXIAL CABLES AND CONNECTIONS

34. General

The coaxial cable connections between the various racks and chassis are listed in this section and are illustrated in figure 39. The cabling is connected between the individual equipment unit cable connectors and the terminal panels at the top of each rack. The rack terminal panels are interconnected by coaxial cabling to complete the equipment coaxial interconnections. Rack A5 has no coaxial cables connected to the terminal panel. Coaxial cables from the equipment units in rack A5 connect to the terminal panel in rack A4. The terminal panel of rack A4 is shown in figure 28. The REMOTE connector on the switch panel is used in diversity operation and is connected to RECEIVER INTERCONNECT jack J8 on the power and signal entry panel. A coaxial cable connects the transmit converter output direct to the input of the power amplifier. The coaxial cable connector locations on the rear of each equipment unit chassis are shown in figures 22 through 31. The power amplifier cable connector locations are shown in figures 33 and 34.

Note: All cables are prefixed with a 31W designation. For example, cable number 57 is labeled 31W57.

35. Rack A1

a. Terminal Panel (fig. 39).

Cable No.	Plug	Terminal board	Jack	Cable function
43	P2	TB16	J3	Rack interconnect to rack A2.
52	P2	TB16	J4	70-mc output of modulator-multiplier.
51	P2	TB16	J4	70-mc signal to transmit converter.
53	P2	TB21	J1	Voice and radio teletypewriter input to multiplexer.
20	P2	TB21	J1	Recd voice and radio teletypewriter input from rack A4.
54	P2	TB21	J2	Voice and radio teletypewriter output from multiplexer.
41	P2	TB21	J2	Voice and radio teletypewriter output to rack A2.
55	P2	TB21	J3	External oscillator signal to transmit converter.
27	P2	TB21	J3	External oscillator signal from rack A3.
56	P2	TB21	J4	Voice and radio teletypewriter output to modulator-multiplier.
40	P2	TB21	J4	Voice and radio teletypewriter output from rack A2.

b. Monitor (fig. 22 and 39)

Cable No.	Plug	Jack	Cable function
62	P1	J1	Line voice monitor signal from multiplexer.
58	P1	J2	Voice and radio teletypewriter output monitor signal from multiplexer.
57	P1	J3	Voice and radio teletypewriter input monitor signal from multiplexer.
59	P2	J4	Telephone terminal input signal to monitor from the BNC tee on if. amplifier No. 2.
61	P1	J5	Telephone terminal output signal to monitor from BNC tee J9 on the modulator-multiplier.
60	P1	J7	Line radio teletypewriter output monitor signal from multiplexer.
63	P2	J8	70-mc output monitor signal from modulator-multiplier.

c. Transmit Converter (fig. 23 and 39)

Cable No.	Plug	Jack	Cable function
51	P1	J5	70-mc input signal from terminal panel.
64	P1	J7	Output signal to power amplifier.
55	P1	J6	External oscillator signal input from terminal panel.

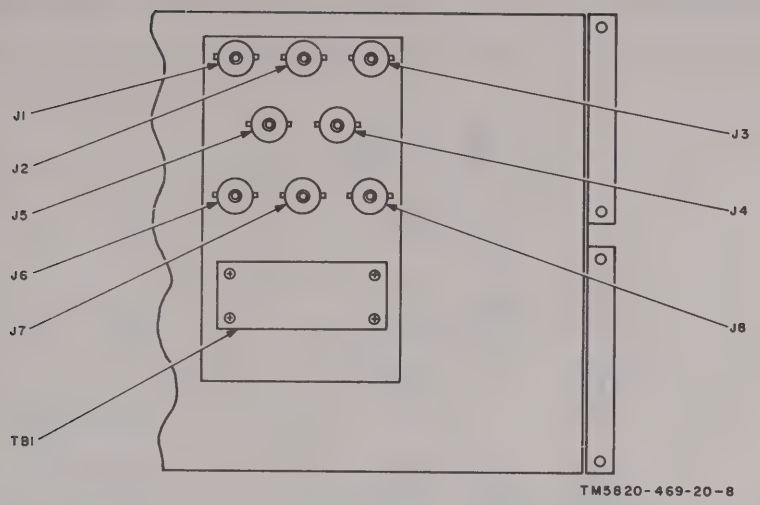


Figure 22. Monitor, rear panel view, location of terminal board and jacks.

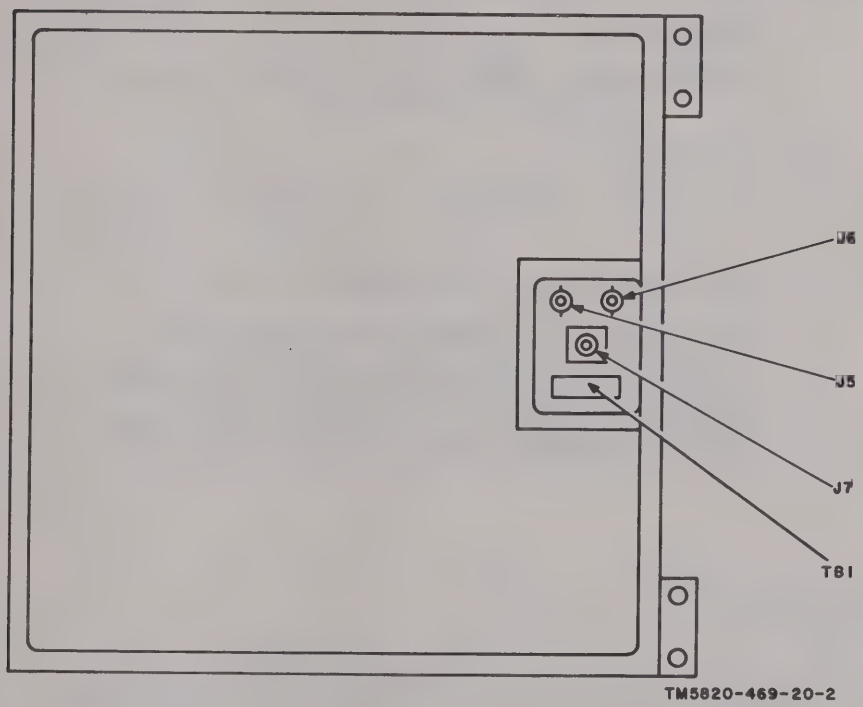


Figure 23. Transmit converter, rear panel view, location of terminal board and jacks

d. Modulator-Multiplier (fig. 24 and 39)

Cable No.	Plug	Jack	Cable function
52	P1	J6	70-mc output signal to terminal panel.
63	P1	J7	70-mc output monitor signal to monitor.
56	P1	J8	Voice and radio teletypewriter output from terminal panel.
19	P2	BNC tee to J9	Telephone terminal output from the telephone terminal.
61	P2	BNC tee to J9	Telephone terminal output signal to monitor.

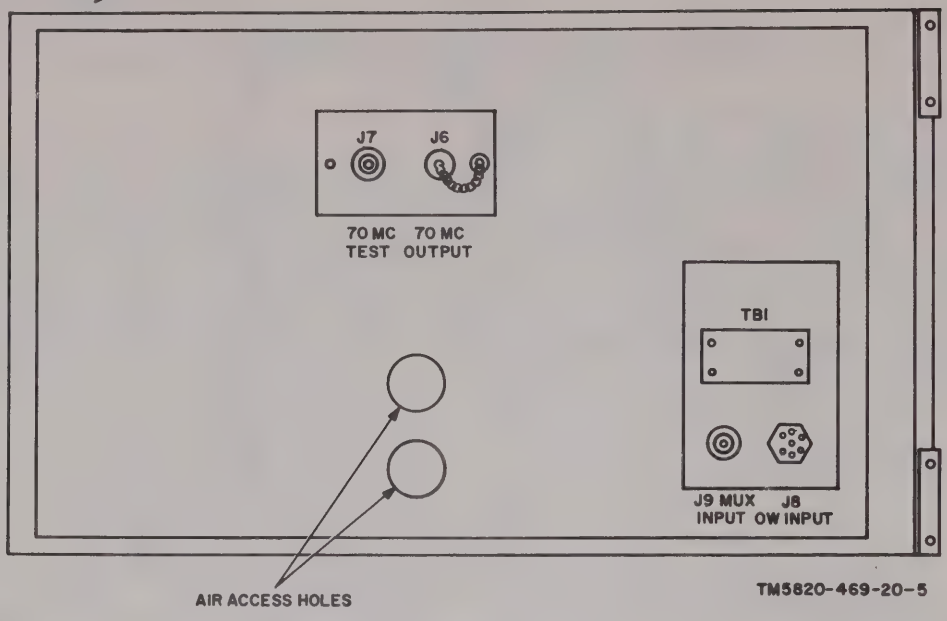


Figure 24. Modulator-multiplier, rear panel view, location of terminal board and jacks.

e. *Multiplexer* (fig. 25 and 39).

Cable No.	Plug	Jack	Cable function
62	P2	J1	Line voice input monitor signal to monitor.
60	P2	J3	Line radio teletypewriter output monitor signal to monitor.
59	P2	J4	To rear of monitor panel (tied back).
58	P2	J5	Voice and radio teletypewriter output monitor signal to monitor.
54	P1	J6	Voice and radio teletypewriter output to terminal panel.
57	P2	J7	Voice and radio teletypewriter input monitor signal to monitor.
53	P1	J8	Voice and radio teletypewriter input from terminal board.

36. Rack A2

a. *Terminal Panel* (fig. 39).

Cable No.	Plug	Jack	Cable function
44	P2	J5	Transmit voice and radio teletypewriter from switch panel.
40	P1	J5	Transmit voice and radio teletypewriter to rack A1.
45	P2	J6	Transmit voice and radio teletypewriter to multiplexer.
41	P1	J6	Transmit voice and radio teletypewriter from rack A1.
46	P2	J7	Receive converter No. 1 output to switch panel.
21	P1	J7	Receive converter No. 1 output from rack A5 through rack A4 terminal panel.
47	P2	J8	Receive converter No. 2 output to switch panel.
23	P1	J8	Receive converter No. 2 output from rack A4.
48	P2	J1	Remote if. tieline to switch panel.
42	P1	J1	Remote if. tieline to power and signal entry panel RECEIVER INTERCONNECT jack J8.
49	P2	J2	If. input No. 2 from switch panel.
25	P1	J2	If. input No. 2 to rack A4.
43	P1	J3	Rack interconnect to rack A1.
50	P2	J4	If. input No. 1 from switch panel.
16	P1	J4	If. input No. 1 to rack A5 through rack A4.

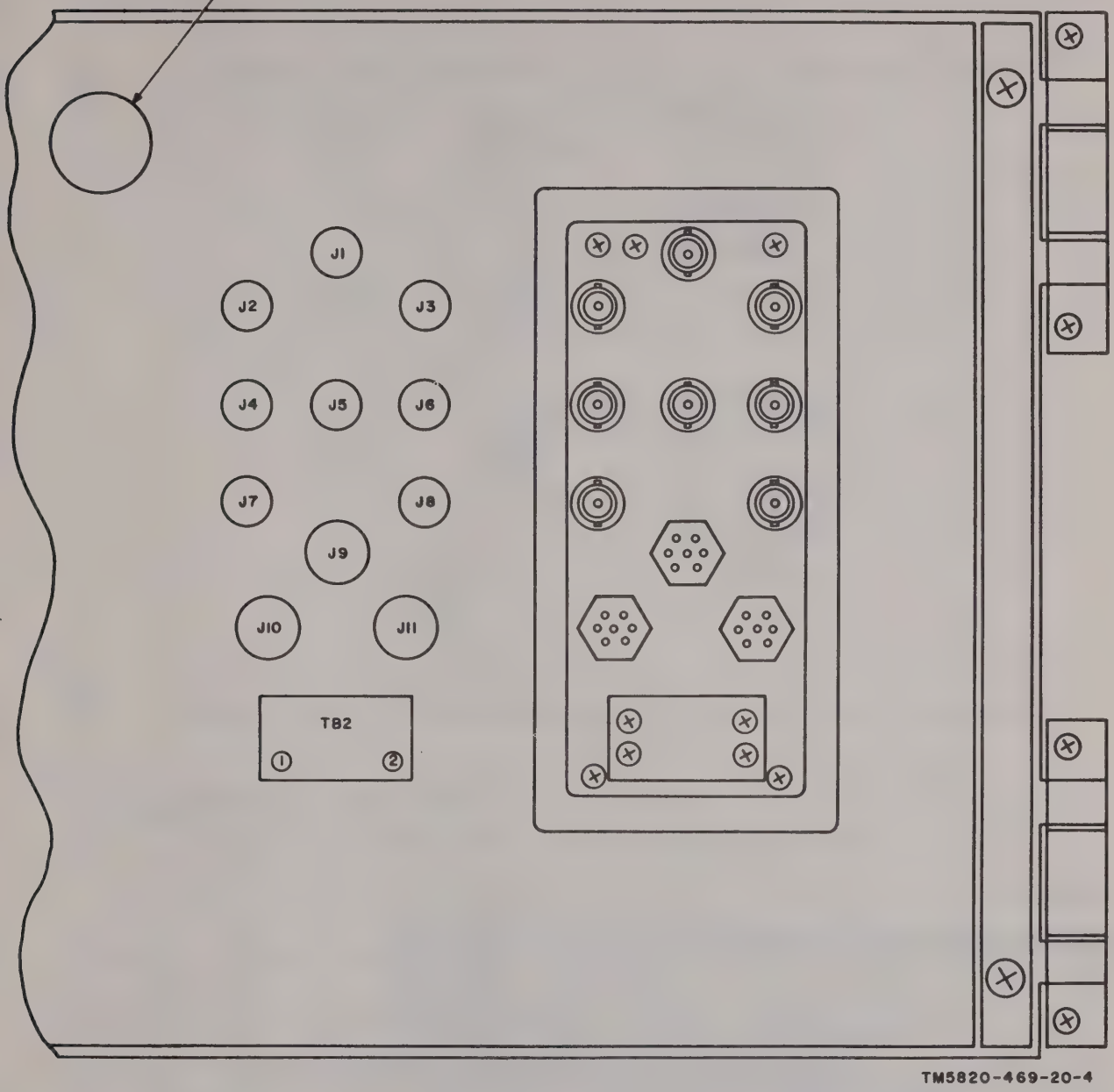


Figure 25. Multiplexer, rear panel view, location of terminal board and jacks.

b. Switch Panel (fig. 26 and 39).

Cable No.	Plug	Jack	Cable function
46	P1	J1	Receive converter No. 1 output from terminal panel.
47	P1	J2	Receive converter No. 2 output from terminal panel.
49	P1	J3	If. in No. 2 to terminal panel.
50	P1	J4	If. in No. 1 to terminal panel.
48	P1	J5	Remote if. tieline to terminal panel.
45	P1	J6	Transmit voice and radio teletypewriter from terminal panel.
44	P1	J7	Transmit voice and radio teletypewriter to terminal panel.

Note: Two cables, 31W69 and 31W70, are used for front panel interconnection of IF IN, RECEIVER OUT, and REMOTE jacks (fig. 23, TM 11-5820-469-10).

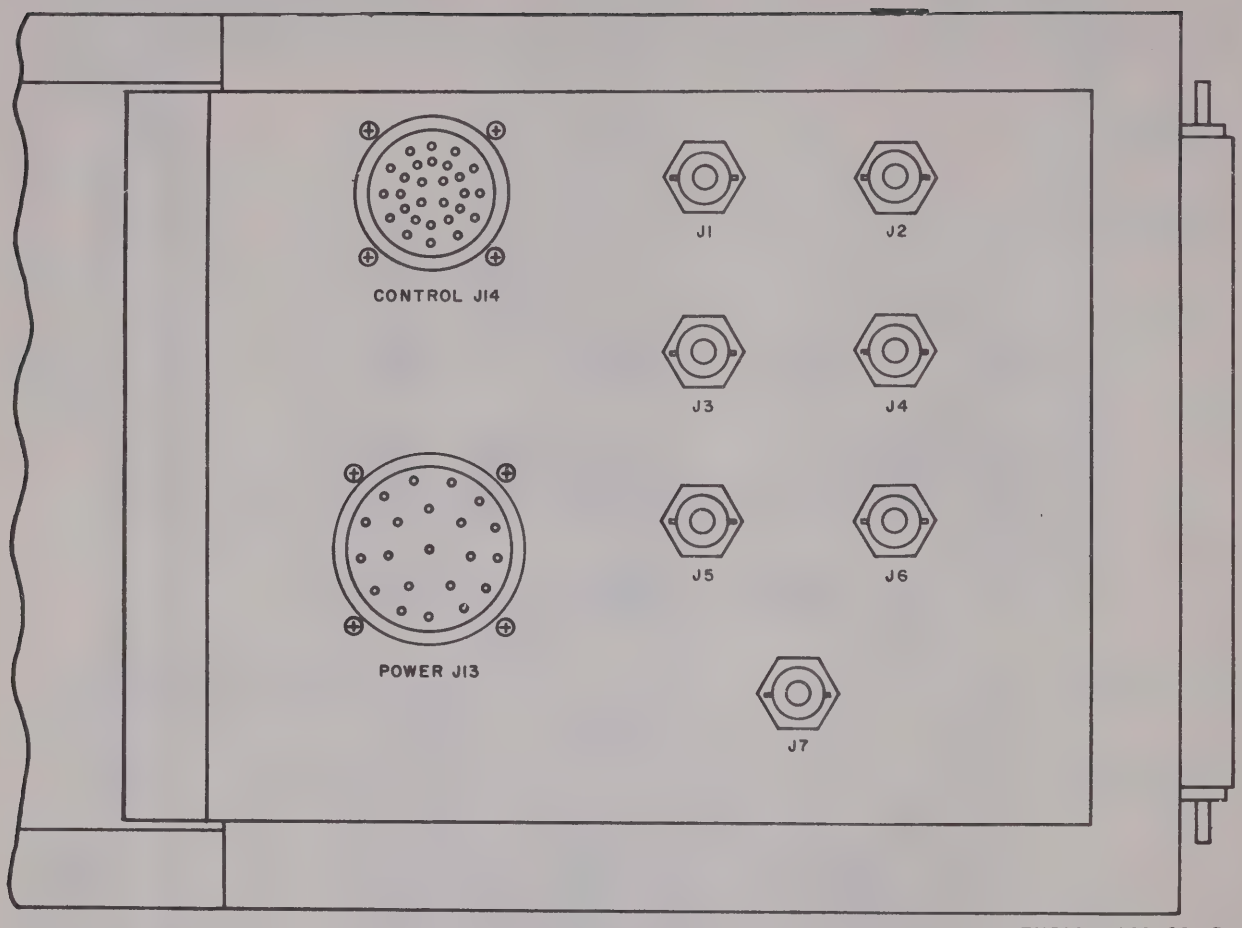


Figure 26. Switch panel, rear view, connector and jack location.

37. Rack A3

a. *Terminal Panel* (fig. 39).

Cable No.	Plug	Jack	Cable function
28	P2	J1	Output from upper synthesizer.
22	P1	J1	Synthesizer output to rack A5 through rack A4 terminal panel.
30	P2	J3	Output from center synthesizer.
27	P1	J3	Synthesizer output to rack A1.
29	P2	J2	Output from lower synthesizer.
24	P1	J2	Synthesizer output to rack A4.

b. *Synthesizer* (fig. 27 and 39).

Cable No.	Plug	Jack	Cable function
28	P1	J36-1	External oscillator signal to receive converter No. 1 (rack 5) through terminal panel.
30	P1	J36-2	External oscillator signal to transmit converter (rack 1) through terminal panel.
29	P1	J36-3	External oscillator signal to receive converter No. 2 (rack 4) through terminal panel.

c. Telephone terminal.

Cable No.	Plug	Jack	Cable function
5	P2	J303	If. input to telephone terminal.
19	P1	J302	Telephone terminal output to modulator-multiplier and monitor.

38. Rack A4

a. *Terminal Panel* (fig. 28 and 39).

Cable No.	Plug	Terminal board	Jack	Cable function
1	P2	TB11	J1	If. signal to amplifier No. 1 (rack A5).
16	P2	TB11	J1	If. signal from rack A2 (switch panel).
18	P2	TB11	J4	If. baseband redundancy interconnect from/to if. amplifier No. 1.
4	P2	TB11	J4	If. baseband redundancy interconnect from/to if. amplifier No. 2.
19	P2	TB16	J1	(Not used, tied back at if. amplifier No. 2.)
5	P2	TB16	J1	Baseband output from if. amplifier No. 1.
6	P2	TB16	J2	Orderwire output from if. amplifier No. 2.
20	P2	TB16	J2	Orderwire output to rack A1 (multiplexer).
7	P2	TB16	J3	Receive converter No. 1 output from rack A5.
21	P2	TB16	J3	Receive converter No. 1 output to switch panel (rack A2).
8	P2	TB16	J4	External oscillator signal to receive converter No. 1 (rack A5).
22	P2	TB16	J4	External oscillator signal from synthesizer (rack A3).
9	P2	TB21	J1	Output from receive converter No. 2.
23	P2	TB21	J1	Receive converter No. 2 output to switch panel (rack A2).
10	P2	TB21	J2	External oscillator signal to receive converter No. 2.
24	P2	TB21	J2	External oscillator signal from synthesizer (rack A3).
11	P2	TB21	J3	If. signal to if. amplifier No. 2.
25	P2	TB21	J3	If. signal from rack A2 (switch panel).
26	P2	TB21	J4	Combiner interconnect to if. amplifier No. 2.
12	P2	TB21	J4	Combiner interconnect to if. amplifier No. 1.

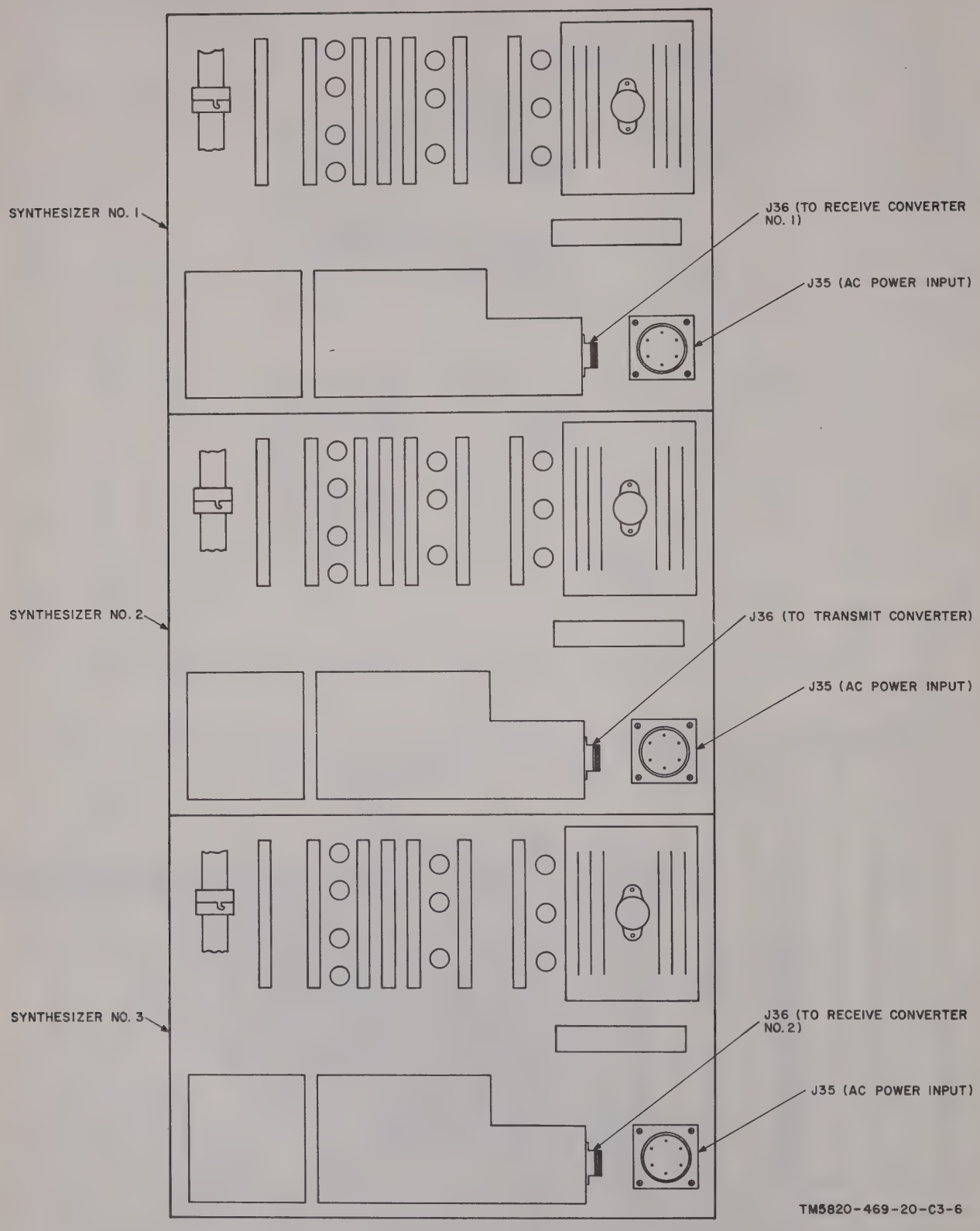


Figure 27. Electrical Frequency Synthesizer, rear view, location of jacks.

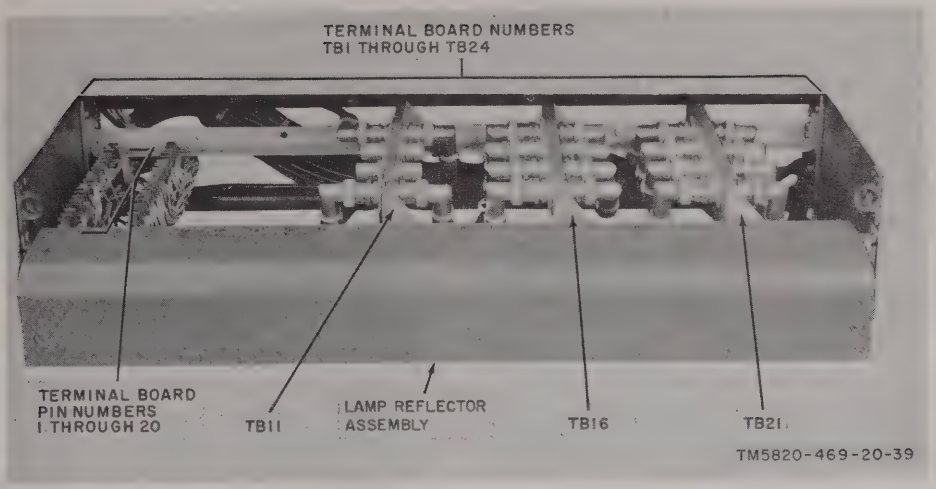


Figure 28. Terminal board, rack A4, location of terminal boards.

b. Receive Converter No. 2 (figs. 29 and 39).

Note. The rear views of both receive converters are identical.

Cable No.	*Plug*	*Jack*	*Cable function*
9	P1	J2 [a]	Converter output to terminal panel.
10	P1	J3 [a]	External oscillator signal from terminal panel.

c. If. Amplifier No. 2 (figs. 30 and 39).

Note. The rear views of if. amplifiers No. 1 and No. 2 are identical.

Cable No.	*Plug*	*Jack*	*Cable function*
11	P1	J1	If. signal input from terminal panel.
26	P1	J2	Combiner interconnect to terminal panel (from/to if. amplifier No. 1).
19			(Tied back from J3, not used).
5	P1	J3	Baseband output to telephone terminal through a BNC tee.
59	P1	J3	Baseband output to monitor through BNC tee.
6	P1	J4	Orderwire output from if. amplifier No. 2.
18	P1	J6	If. baseband redundancy interconnect from/to terminal panel.

39. Rack A5 and Power Amplifier Cabinet

a. Receive Converter No. 1 (figs. 29 and 39).

Note. On some units, J2 has been labeled J16, and J3 has been labeled J17.

Cable No.	*Plug*	*Jack*	*Cable function*
7	P1	J2	Output signal to switch panel (rack A2) through rack A4.
8	P1	P3	External oscillator input from rack A3 through rack A4.

b. If. Amplifier No. 1 (figs. 30 and 39).

Cable No.	*Plug*	*Jack*	*Cable function*
1	P1	J1	Input signal from switch panel (rack A2) by way of rack A4.
12	P1	J3	Combiner output interconnect from/to if. amplifier No. 2 (rack A4).
5	P1	J3	Baseband output interconnect from/to terminal panel (rack A4) to cable 19. Cable 19 tied back behind if. amplifier No. 2.
4	P1	J6	Redundancy interconnect (if. amplifier No. 2 rack A4) from/to terminal panel (rack A4).

CHAPTER 4
REPAIRS AND ADJUSTMENTS

Section I. REMOVAL AND REPLACEMENT PROCEDURES

40. General

a. With the exception of the power amplifier, which is mounted in a cabinet, all the electronic units of the AN/TRC–80B are rack mounted. For the location of the various units within the racks, refer to figures 2 and 5 through 10 of TM 11–5820–469–10. All of the rack-mounted units, except the telegraph terminal, the telephone terminal, the converter power supplies, the mux power supply, the teletypewriter switch panel, and the rack blowers, are hinge-mounted. This permits access to the rear of the chassis. All units in racks A1, A4, and A5 have front protective covers which must be removed to obtain access to the front chassis components. The covers are secured by push-type latches or quarter-turn screw fasteners.

b. To obtain access to the rear chassis connectors on the hinge-mounted units, remove the protective covers and the rack-securing screws on the right side of the unit, and carefully swing the unit outward and to the left.

c. When chassis removal requires that wiring and cables be disconnected, all wires and cables should be adequately marked before they are disconnected from terminal boards or connectors. The removal and replacement procedures for the different types of equipment units are given in paragraphs 41 through 48.

41. Hinge-Mounted Chassis Removal

To remove a hinge-mounted chassis, proceed as follows:

a. Remove the front protective cover from the unit.

b. On the receive converter only, remove the attaching screws and disconnect the waveguide from the upper right-hand corner of the unit.

c. Remove the rack-securing screws at the righthand edge of the unit.

d. Swing the unit completely out on its hinges.

e. Disconnect all external wiring or cables from the unit.

f. Support the weight of the unit so that no weight rests on the hinge.

g. While supporting the weight of the unit, remove the screws that secure the hinges to the rack.

h. Lift the unit carefully away from the rack. Be careful to avoid damage to the hinge-alignment pins.

42. Hinge-Mounted Chassis Replacement

To replace a hinge-mounted chassis, perform the following procedures:

a. Lift the repaired or replacement unit carefully into position on the rack, and engage the alignment pin of each hinge.

CAUTION

Do not rest the weight of the unit on the hinges until the hinge-securing screws are tightened.

b. Install the upper and lower hinge screws. (Do not tighten the screws.)

c. While supporting the unit, carefully swing it out to provide access to the inner hinge screws.

d. Install and tighten the remaining hinge screws, and tighten the screws installed in above.

e. Reconnect the wiring and cables disconnected in the removal of the unit.

f. Swing the unit into the normal position and install the rack-securing screws.

g. Place the protective cover on the unit and secure it in place with the two fasteners.

43. Power Amplifier Drawer Removal and Replacement

To remove and replace the drawers of the power amplifier, follow the procedures given in *a* through *c* below.

WARNING 1

Remove all power to the power amplifier before removing the drawers.

WARNING 2

At least two men are required to handle the power amplifier power supply drawer and the klystron drawer.

a. Power Amplifier Control Panel Drawer Removal.

(1) Depress the red release buttons on the two drawer lock handles of the control panel.

(2) Rotate the two lock handles outward, to the horizontal position.

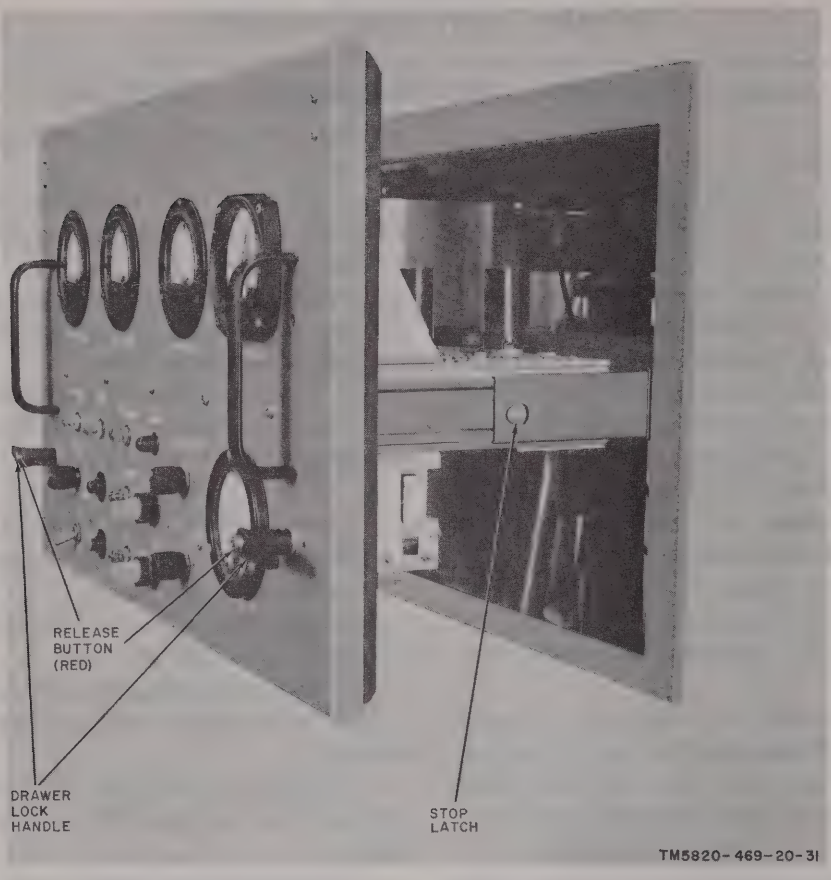


Figure 32. Power amplifier control panel, drawer removal details.

(3) Pull the drawer straight forward to the stops.

(4) Press the two stop latches on the sides of the two drawer slides and remove the drawer from the cabinet.

b. Power Amplifier Control Panel Drawer Replacement (fig. 32).

(1) Extend the drawer slides fully to their latch positions.

(2) Lift the control panel drawer to mate with the drawer slide.

(3) While supporting the weight of the drawer, press the two stop latches and push the drawer onto the slides.

(4) Close the drawer completely to engage the mating connector at the rear of the unit.

(5) Rotate the two drawer lock handles downward until they latch into place.

c. Power Amplifier Power Supply Drawer Removal (fig. 33).

(1) Press the red buttons on the two power supply drawer lock handles.

(2) Rotate the two lock handles outward, to the horizontal position.

(3) Pull the drawer straight forward to the stop.

CAUTION

Do not attempt to remove the drawer from the cabinet before disconnecting the cables from J301 and J302. Be careful not to snag the cables against the drawer edge when removing the power supply drawer.

(4) Disconnect the cables from J301 and J302.

(5) Release the drawer stop latches at the sides of the drawer and remove the drawer from the cabinet.

d. Power Amplifier Power Supply Drawer Replacement (fig. 33).

(1) Slide the power supply drawer into the cabinet to the drawer stop latch.

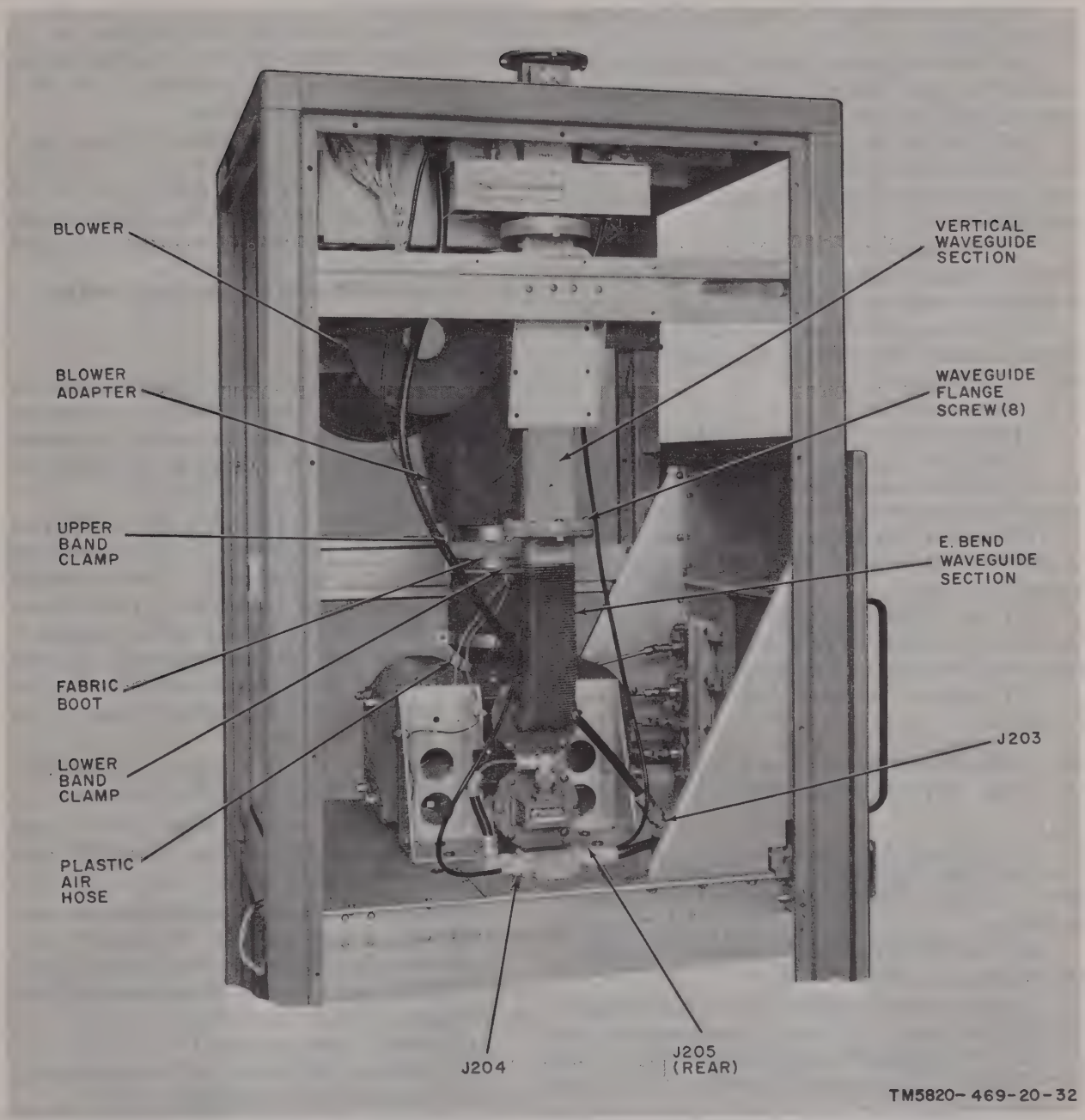


Figure 34. Klystron drawer, side view, drawer removal detail.

Note. Be sure that these wires are adequately marked.

(7) Remove plug P9 from the SEND jack on the TH-5A/TG.

(8) Remove plug P10 from the REC. jack on the TH-5A/TG.

(9) While supporting the weight of the shelf, remove the four rack-mounting screws that secure the shelf to the rack.

(10) Remove the shelf, with the TH-5A/TG and the teletypewriter switch panel attached, and place it bottom up to provide access to the mounting screws.

(11) Remove the six teletypewriter switch panel mounting screws; remove the unit and set it aside for repair or replacement.

(12) Remove the four TH-5A/TG mounting screws; remove the unit and set it aside for repair or replacement.

b. Replacement.

(1) Secure the TH-5A/TG to the righthand

Note. The front edge of the shelf is the edge toward which the mounting brackets slope.

side of the shelf with the four mounting screws.

(2) Secure the teletypewriter switch panel to the left-hand side of the shelf with the six mounting screws.

(3) Lift the shelf, with the two units attached, into position on rack A2, and secure it in place with the four rack-mounting screws.

(4) Replace the cables and wires removed in *a* above.

46. Rack Blower Removal and Replacement
(fig. 35)

a. Removal. Each of the rack blowers (fig. 7, and 9, TM 11-5820-469-10) is removed as follows:

(1) Loosen the four screw-type fasteners and remove the air filter unit.

Note. The fuse indicators (F1, F2, and F3) are now accessible.

(2) Swing out the unit directly above the blower (para 41).

(3) Remove power connector J1 from the power receptacle.

(4) Remove the eight screws that secure the duct assembly to the rack plenum.

(5) Remove the four screws that secure the blower assembly to the rack.

(6) Remove the blower assembly from the rack.

b. Replacement. Each of the rack blowers is replaced as follows:

(1) Place the blower into position on the rack and secure it with the four mounting screws.

(2) Secure the duct assembly to the rack plenum with the eight screws.

(3) Connect power connector J1 to the power receptacle.

(4) Mount the air filter unit in place on the housing and secure the four screw-type fasteners.

(5) Secure the unit removed in *a*(2) above.

47. Air-Conditioning Unit Removal and Replacement
(fig. 36)

Refer to the instruction book issued with the air conditioner for the detailed repair procedures. The air-conditioning units are removed for maintenance or repair and replaced as instructed below:

Warning: **Turn off all power before removing or replacing any unit within the air conditioner.**

a. Condenser Unit Removal. Two condenser units are installed on the inside of the louvered door on the right side of the shelter. Access to the condenser units for maintenance is obtained by lowering the door, which is hinged along the bottom and is held in a horizontal position by two support cables.

(1) Unscrew the four captive screws from each side of the air conditioner access door.

(2) There are seven captive screws along the top of the door. Unscrew all except the center screw.

Caution: **Two men are required to handle the heavy door.**

(3) Carefully unscrew the center screw, while supporting the weight of the door and condenser units.

(4) Slowly lower the door.

(5) Remove the power and control cables, and the auxiliary time delay cable.

(6) Remove the ground strap by removing the securing screw.

Caution: **The sections of the refrigerant lines are under pressure and are equipped with automatic sealing devices to retain the refrigerant when the lines are disconnected. When a line connection**

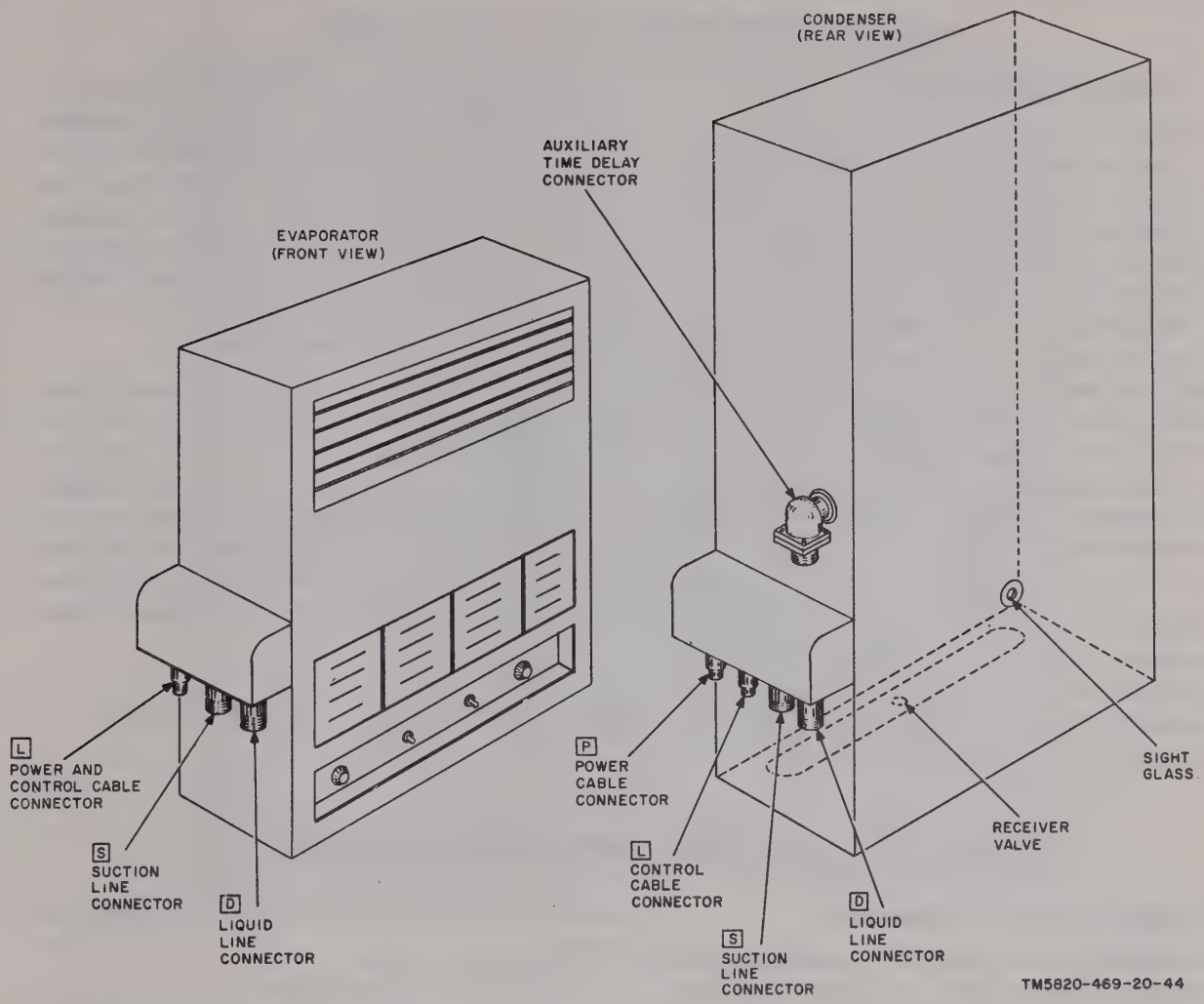


Figure 36. Air conditioner evaporator and condenser units, location of connectors.

(2) Connect the refrigerant line stamped S on the flats of the hexagonal fitting to the fitting on the evaporator unit marked S. Use two wrenches, one to hold the fitting on the unit stationary, and the other to snug up the coupling to approximately 35 foot-pounds of torque. *Do not allow the fitting on the unit to turn. Avoid kinking or twisting the hose.*

(3) Connect the refrigerant line stamped D on the flats of the hexagonal fitting to the fitting on the evaporator unit marked D. Follow the same procedure as detailed in (2) above.

(4) Connect the 14-wire electrical cable to the receptacle marked L.

48. Removal and Replacement of Components in Antenna AS-1270/TRC-80

Most of the components within the antenna assembly are readily accessible and easily replaced. Removal of heavy mechanical components and procedures that require special tools and equipment are beyond the scope of organizational maintenance personnel. Refer to paragraph 53 for the antenna patching procedures.

Note: The antenna platform must be raised prior to removing or replacing any component within the antenna assembly. Refer to TM 11-5820-469-10 for antenna erection.

Section II. TUBE TESTING AND REPLACEMENT

49. Tube-Testing Procedures

When the AN/TRC–80B fails to operate properly, use the sectionalizing procedures in paragraphs 16 through 20 to sectionalize the defect to an equipment group, and the localizing procedures in paragraphs 21 through 33 to locate the defective unit or assembly. Perform the corrective actions for the abnormal indications noted and, where tube failure is suspected, use the applicable procedure below to check the tubes. With the exception of traveling wave tube V9, and klystron tube V201, all tubes are readily accessible and easily replaced. Remove all power from the equipment before removing the tubes.

NOTE

Klystron tube V201 in the klystron drawer of the power amplifier and traveling wave tube V9 in the transmit converter must be replaced by higher category maintenance personnel.

a. Tube Tester Method. Remove and test one tube at a time. Discard a tube only if its defect is obvious or if the tube tester shows it to be defective. Immediately discard tubes that are shorted or contain heater-to-cathode leakage. Do not discard a tube that tests at or near its minimum test limit on the tube tester. Replace the original tube, or insert a new one if required, before testing the next one.

b. Tube Substitution Method. Replace a suspected tube with a new tube. If the AN/TRC–80B still fails to operate properly, remove the new tube and return the original tube to its socket. Repeat this procedure with each original tube until the radio set becomes operative or until all suspected tubes have been tested and the need for higher category repair is indicated.

50. Paragraph 50 is no longer used.

Section III. ADJUSTMENT AND REPAIR PROCEDURES

51. Liftscrew Chain Adjustment

An adjustable idler sprocket is contained in the antenna compartment. The idler sprocket may be adjusted to tighten the liftscrew chain. The liftscrew chain is sufficiently taut when there is no visible sag between sprockets. The chain is inspected at 30-day intervals (para 6, sequence No. 9). If any sag is noted, tighten the chain as follows:

a. For equipments procured on Order No. 4255–PP–61, perform the procedures given in paragraph 11*b*(1) through (4). For equipments procured on Order No. 15058–PP–62, perform the procedures in paragraph 11*b*.1(1) through (4).

b. Inspect the liftscrew chain. If the liftscrew chain has visible sag, continue with the procedures given in *c* through *f* below; if it has no visible sag, proceed directly to *f* below.

c. Loosen the four studs on the movable idler sprocket plate so that the plate can barely be moved.

CAUTION

Do not overtighten. The operation of the chain does not depend on tension.

d. Move the plate in a direction to tighten the chain until no sag is visible.

e. Tighten the four studs.

f. For equipments procured in Order No. 4255–PP–61, perform the procedures given in paragraph 11*b*(9). For equipments procured on Order No. 15058–PP–62, perform the procedures given in paragraph 11*b*.1(6).

51.1 Platform Brake Adjustment

a. Disengage the coarse azimuth locking pin (fig. 3).

b. Depress the BRAKE pedal to lock the azimuth platform and prevent manual rotation of the platform.

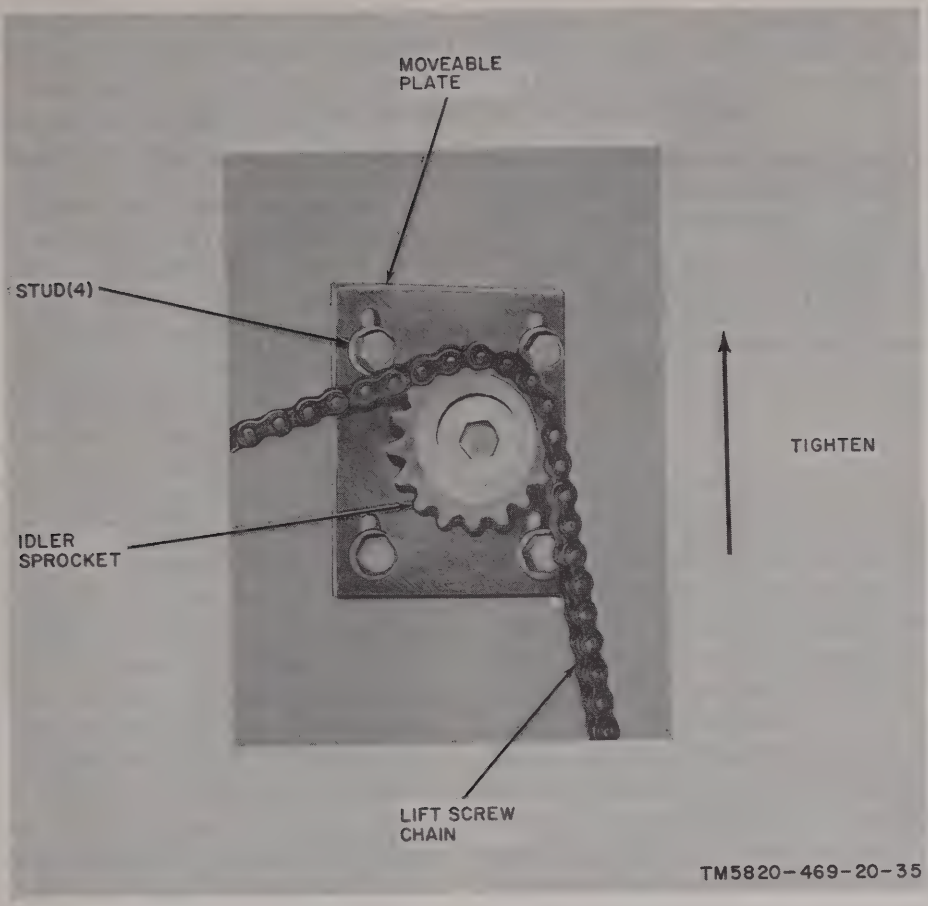


Figure 37. Liftscrew chain adjustment details.

c. If the braking action is inadequate, proceed as follows:

(1) Obtain access to the antenna compartment.

NOTE

For equipments procured on Order No. 4255–PP–61, refer to paragraph 11*b*. For equipments procured on Order No. 15058–PP–62, refer to paragraph 11*b*.1.

(2) Adjust the brake adjusting rod (fig. 4.1) until sufficient braking is obtained.

(3) On equipments procured on Order No. 4255–PP–61, replace the antenna compartment hatch covers; swing the hinged units on rack A2 back to their normal positions, and replace the rack-securing screws.

(4) on equipments procured on Order No. 15058–PP–62, replace and secure the antenna compartment access plate and close the air conditioner door.

52. Antenna Platform Elevation Liftscrew Adjustment

(fig. 1)

If it becomes difficult or impossible to lock all antenna platform locking handles in either the elevated or lowered position, adjust the elevation liftscrew. The procedure is as follows:

a. If the antenna is in the stowed condition, elevate the platform and lock at least three of the antenna platform locking handles (fig. 3). (Refer to TM 11–5820–469–10 for antenna erection details.)

b. For equipments procured on Order No. 4255–PP–61, perform the procedures given in

paragraph 11*b*(1) through (4). For equipments procured on Order No. 15058–PP–62, perform the procedures in paragaph 11*b*.1(1) through (4).

c. Locate the chain joint (master link). Tie a wire noose (stranded wire) between the links on either side of the master link.

d. Remove the master link from the chain, and lift the chain away from each sprocket.

e. If any of the platform locking handles were not locked, use the crank (fig. 37, TM 11–5820–469–10) and crank the elevation liftscrew for the unlocked locking handle until it can be locked. Leave all four handles locked.

f. Beginning with the left-hand rear and righthand rear screws (opposite the personnel door), crank each liftscrew (while locked) to determine

CHAPTER 5

BLOCK AND DIAGRAM FUNCTIONING

54. General
(fig. 38)

The block diagram will aid the organizational repairman in the understanding of signal flow and the relationship of the equipment groups within the AN/TRC–80B. The direct current (dc) power supplies, switch panel, engine generator, and air conditioner units have been omitted from the block diagram. Outgoing radio signals to a distant AN/TRC–80B can be originated by voice or teletypewriter by the local operator, by signals originating at the programmer test station (pts), or by the external telephone terminal subscriber. Signals originating from the pts are routed through the power and signal entry panel and Communications Control Panel SB–1564/TRC–80 to the radio circuits of the AN/TRC–80B. Signals originating from local external telephone terminal subscriber are routed through the power and signal entry panel and Telephone Terminal TA–833/TRC to the radio circuits of the AN/TRC–80B. Incoming radio signals from the distant AN/TRC–80B are routed to the communication control panel and telephone terminal. Incoming signals routed through the communication control panel are routed to the local operator's teletypewriter, headset or speaker, or through the power and signal entry panel to the pts. Incoming signals applied to the telephone terminal are routed through the power and signal entry panel to the external telephone terminal subscribers. The local operator can also establish voice or teletypewriter communication with the remote (local) facilities that are routed through the communication control panel (fig. 38). The operator or the pts can take control of the radio circuits of the AN/TRC–80B; the other remote facilities, consisting of the army area net and vehicle radio, can establish voice or teletypewriter communication with the local AN/TRC–80B operator but cannot take control of the radio facilities. The telephone terminal subscribers can establish communication with distant subscribers once radio communication is effected. These four telephone terminal voice frequency channels do not affect, nor are they affected by, the other AN/TRC–80B facilities. Refer to TM 11–5820–469–10 for details of system application.

55. Transmission Path

a. Input Circuits. Speech and teletypewriter signals from the local operating position or from the pts facility (through the power and signal entry panel) are applied to Communication Control Panel SB–1564/TRC–80 (control panel). Signals originating at the local teletypewriter are converted from dc teletypewriter signals to voice frequency (vf) signals (1,225 hertz per second (Hz) and 1,325 Hz) by Telegraph Terminal TH–5A/TG or TH–22/TG. Signals originating at pts are in vf form and are converted by the switching circuits from two-wire vf teletypewriter signals to four-wire line operation. The voice frequency signals from the telephone terminal subscribers (through the power and signal entry panel) are applied to the Telephone Terminal TA–833/TRC. Voice or vf signaling signals originated by the telephone terminal subscriber are converted to baseband frequencies and applied to the modulator-Multiplier MD–465/TRC–80. The baseband output is also applied to Audio Frequency-Radio Frequency Monitor MX–8383/TRC–80B for monitoring.

b. Demultiplexer-Multiplexer TD–550/TRC–80. With the control panel set up for radio communication, the speech and vf teletypewriter signals are routed to Demultiplexer-Multiplexer TD–550/TRC–80 (multiplexer) where the frequency of the teletypewriter vf signals are converted to 4,225 Hz and 4,325 Hz and then combined with the outgoing speech signals. The speech input signals and the composite speech vf teletypewriter output signals

(orderwire) are also applied to the monitor for visual monitoring.

b. 1. *Telephone Terminal TA–833/TRC.* The telephone terminal accepts four, two-wire or four-wire landlines, converting the two-wire to four-wire for inter-unit transmission. The telephone terminal channel modems translate the four input signals into four adjacent channels in the 92.6- to 107.7-kHz frequency band. The modem outputs are combined and applied to a subgroup modulator where the composite modem signals are translated to a 12.3- to 27.4-kHz frequency band. A 28–kHz reference pilot signal is combined with the subgroup modulator output and the composite signal (a 12- to 28-kHz baseband) is applied to the modulator-multiplier. The baseband output of the telephone terminal is also applied to the monitor for monitoring.

c. Modulator-Multiplier MD–465/TRC–80. The modulator-multiplier accepts two input signals. One is a composite speech and teletypewriter signal (order-wire input) from the multiplexer. The other is a baseband signal (multiplex input) from the telephone terminal. The order-wire input signal phase modulates the modulator-multiplier oscillator frequency and is multiplied by a factor of 6. The multiplex input signal phase modulates the multiplied signal from the order-wire phase modulator and the output of this second phase modulator is multiplied by a factor of 16. The output of the modulator-multiplier, a 70-MHz (center frequency) frequency modulated signal is applied to the Amplifier Converter AM–4917/TRC (transmit converter). The modulator-multiplier output is also applied to the monitor for monitoring.

d. Amplifier-Converter AM–4917/TRC. The transmit converter accepts two input signals. One is a 1,082.5- to 1,232.4875-MHz signal from Electrical Frequency Synthesizer 0–1462A/TRC (synthesizer). The synthesizer signal is multiplied by a factor of 4 (by the varactor multiplier) and mixed with the 70–MHz frequency modulated signal from the modulator-multiplier. The resultant output signal (in the 4,400.00- to 4,999.95-MHz frequency range) is applied to Radio Frequency Amplifier AM–3308/TRC–80 (power amplifier).

e. Radio Frequency Amplifier AM–3308/TRC–80. The 4,400.00- to 4,999.95-MHz signal from the transmit converter is used as the driving power for a four cavity klystron tube located in the power amplifier. The output of the power amplifier (1 kilowatt) is applied through a flexible waveguide to the bipolarized feedhorn and antenna reflector.

56. Receiving Path

a. Antenna AS–1270/TRC–80. Polarized 4,400.00- to 4,999.95-MHz signals are received by the antenna reflector and passed through the bipolarized feedhorn and a flexible waveguide to a circulator. In diversity operation, when two signals are being received, the circulator routes the received signals to the inputs of receiver No. 1 and receiver No. 2.

b. Amplifier-Converter AM–4916/TRC. The amplifier-converter (receive converter) accepts two input signals. One signal is a 1,082.5- to 1,232.4875-MHz signal from the synthesizer. The synthesizer signal is multiplied by a factor of 4 (by the varactor multiplier). The other signal is the incoming radio-frequency (RF) signal from the circulator. The two signals are applied to a mixer circuit; and a difference frequency of 70 MHz is selected, amplified, and routed to Intermediate Frequency Amplifier AM–6208/TRC–80B.

c. Intermediate Frequency Amplifier AM–6208/TRC–80B. The 70-MHz input signal applied to the IF amplifier is mixed with he output of a 78-MHz oscillator circuit. The 8–MHz difference frequency is amplified and applied to a discriminator combiner circuit that recovers the order-wire (original vf teletypewriter and speech) and baseband (telephone terminal) signals. When both receivers are used (in diversity operation) the output of the combiners and redundancy connections are combined; and the order-wire and baseband signals of IF amplifier no. 2 are routed to the multiplexer (order-wire) and to the telephone terminal (baseband). The outputs of IF amplifier No. 2 are also applied to the monitor.

d. Demultiplexer Multiplexer TD–550/TRC–80. The multiplexer accepts its order-wire output from IF amplifier No. 2 and separates the vf teletypewriter and speech signals.

(1) *Teletypewriter circuit.* The 300- to 4,325-Hz order-wire signal is applied to a bandpass filter that rejects the speech signal and passes the 4,225- to 4-325-Hz vf teletypewriter signals. The bandpassed signals are mixed with a 3–kHz signal and converted from 4,225 Hz and 4,325 Hz to 1,225 Hz and 1,325 Hz. The teletypewriter signals are routed to the teletype switch panel and monitor.

(2) *Speech circuits.* The 300- to 4,325-Hz orderwire signal is also applied to a low-pass filter that rejects all frequencies above 3,500-Hz; therefore, only the speech signals are passed. The low-pass filter output is amplified and routed to the control panel.

d. 1. *Telephone Terminal TA–833/TRC.* The telephone terminal accepts its baseband input from IF amplifier no. 2, converting and separating the baseband to the original four channels of voice and/or voice frequency signals. The subgroup demodulator accepts the 12- to 28–kHz baseband from the IF amplifier and translates it to a 92.6- to 108-kHz frequency band. The composite 92.6 to 108-kHz signal is applied to channel modems that extract the individual channel signal and recover the original voice frequency signals. For each channel, the voice frequency signal is applied to a signaling/termination unit. This unit converts the four-wire (telephone terminal) circuits to either two-wire or four-wire landline circuits and extracts the 1600-Hz signaling tone for 20-Hz ringdown signaling. The output of the telephone terminal is routed through the power and signal entry panel to connecting landlines.

e. Output Circuits. Teletypewriter signals intended for the local teletypewriter are routed from the control panel to the telegraph terminal. The telegraph terminal converts the vf signals to dc signals and applies the dc pulses to the local teletypewriters. Speech signals intended for the operator are routed to the local headset. Speech and teletypewriter signals for pts are applied through the power and signal entry panel to the connecting landlines.

APPENDIX I

REFERENCES

Following is a list of applicable references available to the organizational maintenance personnel of Radio Terminal Set AN/TRC-80B.

AR 755-15	Disposal of Unwanted Radioactive Material.
DA Pam 310-4	Index of Technical Manuals, Technical Bulletins, Supply Manuals (types 7, 8, and 9), Supply Bulletins, and Lubrication Orders.
DA Pam 310-7	U. S. Army Equipment Index of Modification Work Orders.
MWO 11-5800-207-30/1	Synthesizer Modification.
TM 11-5805-246-10	Operator's Manual: Terminal, Telegraph, TH-5/TG.
TM 11-5805-246-20	Organizational Maintenance Manual: Terminal, Telegraph TH-5/TG.
TM 11-5805-356-12	Organizational Maintenance Manual: Terminal, Telegraph-Telephone AN/TCC-29.
TM 11-5815-206-12	Organizational Maintenance Manual: Teletypewriter Set AN/PGC-1 and Teletypewriters TT-4A/TG, TT-4B/TG, TT-4C/TG, TT-335/TG, and TT-537/G.
TM 11-5820-469-10	Operator's Manual: Radio Terminal Set AN/TRC-80B.
TM 11-5820-469-20P	Organizational Maintenance Repair Parts and Special Tool Lists: Radio Terminal Set AN/TRC-80.
TM 11-6625-274-12	Operator's and Organizational Maintenance Manual: Test Sets, Electron Tube TV-7/U, TV-7A/U, TV-7B/U, and TV-7D/U.
TM 11-6625-366-15	Organizational, DS, GS, and Depot Maintenance Manual: Multimeter TS-352B/U.
TM 38-750	Army Equipment Record Procedures.

PART OR COMPONENT	MAINTENANCE FUNCTION	ECHELON 1	2	3	4	5	TOOLS REQUIRED	REMARKS
RADIO TERMINAL SET AN/TRC-80B								
	service		x				34	
	adjust	x						
				x			15,16,27,32,35	
	inspect		x				34	
	test		x				16,30	
				x			5,15,16,20,21,23,24, 25,26,27,30,36	
					x		1 thru 5, 7 thru 9,13, 15,16,18,20 thru 27,30 35,36,38	
						x	1 thru 18, 20 thur 29, 31,32,33,35 thru 38	
	repair		x				34 at 2nd, 32 at 3rd thru 5th, 33 at 4th & 5th, 19 at 2nd thru 5th	
	align			x			5,15,16,20,21,27,36	
					x		5,9,15,16,20 thru 23, 25,26,27,32,36	
	overhaul				x		32	Plus shop support
						x	32,33	Plus shop support
AIR CONDITIONER								Separate MAC (Engrs)
AMPLIFIER MODULATOR GROUP								
	replace		x				34	
	repair			x			32	
					x		33	
AMPLIFIER CONVERTER AM-4917/TRC.								
	replace		x				34	
	repair			x			32	
					x		33	
MODULATOR MULTIPLIER MD-465/TRC-80	replace		x				34	
	repair			x			32	
					x		33	
AMPLIFIER, RADIO FREQUENCY AM-3308/TRC	repair		x				34	
				x			32	
					x		33	
CONTROL DRAWER	replace		x				34	
	repair			x			32	
					x		33	
KLYSTRON DRAWER	replace		x				34	
	repair			x			32	
					x		33	

PART OR COMPONENT	MAINTENANCE FUNCTION	ECHELON 1	2	3	4	5	TOOLS REQUIRED	REMARKS
AN/TRC-80B (CONTINUED)								
POWER SUPPLY DRAWER								
	replace		x				34	
	repair			x			32	
					x		33	
ANTENNA AS-1270/TRC-80								
	replace					x	32,33	Plus shop support
	repair		x				34	
				x			32	
					x		33	
FEED HORN AND STRUTS								
	replace	x						
PATCH KIT	replace		x					Expendable
REFLECTOR INFLATABLE	replace		x				34	
	repair		x				19,34	
WAVEGUIDE	replace	x						
CONSOLE, COMMUNICATION CONTROL SB-1564/TRC-80								
	replace		x				34	
	repair			x			32	
	repair				x		33	
COOLER, AIR ELECTRONIC EQIPMENT HD-545/TRC-80								
	replace		x				34	
	repair			x			32	
					x		33	
DEMULTIPLEXER-MULTIPLEXER TD-550/TRC-80								
	replace		x				34	
	repair			x			32	
							33	
ENGINE GENERATOR								Separate MAC (Engrs)
CONTROL PANEL, AUXILIARY (ENGINE GENERATOR)								Separate MAC (Engrs)
HEADSET ASSY								
	replace	x						Running spares
	repair					x	32,33	
MONITOR, AUDIO FREQUENCY-RADIO FREQUENCY MX-8383/TRC-80B.								
	replace		x				34	
	repair			x			32	
					x		33	

PART OR COMPONENT	MAINTENANCE FUNCTION	ECHELON 1	2	3	4	5	TOOLS REQUIRED	REMARKS
AN/TRC-80B(CONTINUED)								
PANEL, POWER DISTRIBUTION SB-1565/TRC-80	replace		x				34	
	repair			x			32	
					x		33	
RECEIVER, RADIO								
	replace		x				34	
	repair			x			32	
	repair				x		33	
AMPLIFIER CONVERTER AM- 4916/TRC.								
	replace		x				34	
	repair			x			32	
					x		33	
AMPLIFIER, IF. AM- 6208/TRC-80B.	replace		x				34	
	repair			x			32	
					x		33	
POWER SUPPLY PP-3313/TRC-80								
	replace		x				34	
	repair			x			32	
					x		33	
POWER SUPPLY PP- 4936/TRC.	replace		x				34	
Power Supply PP-6290/TRC.	repair			x			32	
					x		33	
SYNTHESIZER, ELECTRICAL FREQUENCY O-1462A/TRC.								
Telephone Terminal TA-833/TRC.	replace		x				34	
	repair			x			32	
					x		33	
TELETYPE HYBRID ASSY								
	replace		x				34	
	repair			x			32	
					x		33	
TELETYPEWRITER TT-335/TG								Separate MAC
TERMINAL TELEGRAPH TH-5A/ G								Separate MAC

Section III. ALLOCATION OF TOOLS FOR MAINTENANCE FUNCTIONS

TOOLS REQUIRED FOR MAINTENANCE FUNCTIONS	ECHELON 1	2	3	4	5	TOOL CODE	REMARKS
AN/TRC-80B (CONTINUED							
Analyzer, Spectrum TS-723/U				†	†	1	
Attenuator, Variable CN-318/U				†	†	2	
Attenuator, Variable CN-762/U				†	†	3	
Attenuator, Variable CN-764/U				†	†	4	
Blower -60 CPS (Collins Radio)			†	†	†	5	**
Calorimeter, Varian V-4030/7A					†	6	*
Comparator, Freq, CM-77/USM				†	†	7	
Frequency Meter AN/URM-80				†	†	8	
Frequency Meter AN/USM-26				†	†	9	
Indicator Standing Wave Ratio AN/USM-37					†	10	
Loop Converter (Collins Radio #522-6798-00)					†	11	*
Manometer, Vernon Hill and Co. Type C+					†	12	*
Meter, Modulation ME-57			†	†	†	13	
Meter, Noise Figure Hewlett Packard HP 342A					†	14	*
Multimeter ME-26/U			†	†	†	15	
Multimeter TS-352/U		†	†	†	†	16	
Noise source Hewlett Packard HPG-347A					†	17	*
Oscilloscope AN/USM-81				†	†	18	
Patch Kit (for Ant. Bag)		†	†	†	†	19	Expendable
Power Supply PP-3313/TRC-80			†	†	†	20	**
Power Supply PP-4936/TRC; Power Supply PP-6290/TRC.			†	†	†	21	**
Receiver, Radio R-390/URR				†	†	22	
Signal Generator AN/URM-48			†	†	†	23	
Signal Generator AN/URM-52			†	†	†	24	
Signal Generator AN/USM-44				†	†	25	
Signal Generator AN/GRM-50			†	†	†	26	
Signal Generator SG-71/FCC			†	†	†	27	
Slotted line section Hewlett Packard HPG 810B					†	28	*
Test Set Electron Tube TV-2/U					†	29	
Test Set Electron Tube TV-7/U		†	†	†		30	
Test Set, R.F. Power AN/USM-96A			†	†	†	31	
Tool Kit, Radar and Radio Repair TK-87/U			†	†	†	32	
Tool Kit, Radar and Radio Repair TK-88/U				†	†	33	
Tool Kit Radio Repair TK-115/G			†			34	
Transmission Measuring Set TS-559A/FT				†	†	35	
Voltmeter, ME-30A/U			†	†	†	36	
Water Load, Varian V-4023B					†	37	*
Watch, Stop FSN 6645-719-8670				†	†	38	

*In process of being nomenclatured.
**These items are part of facilities required for bench testing. More will be added as they become available.

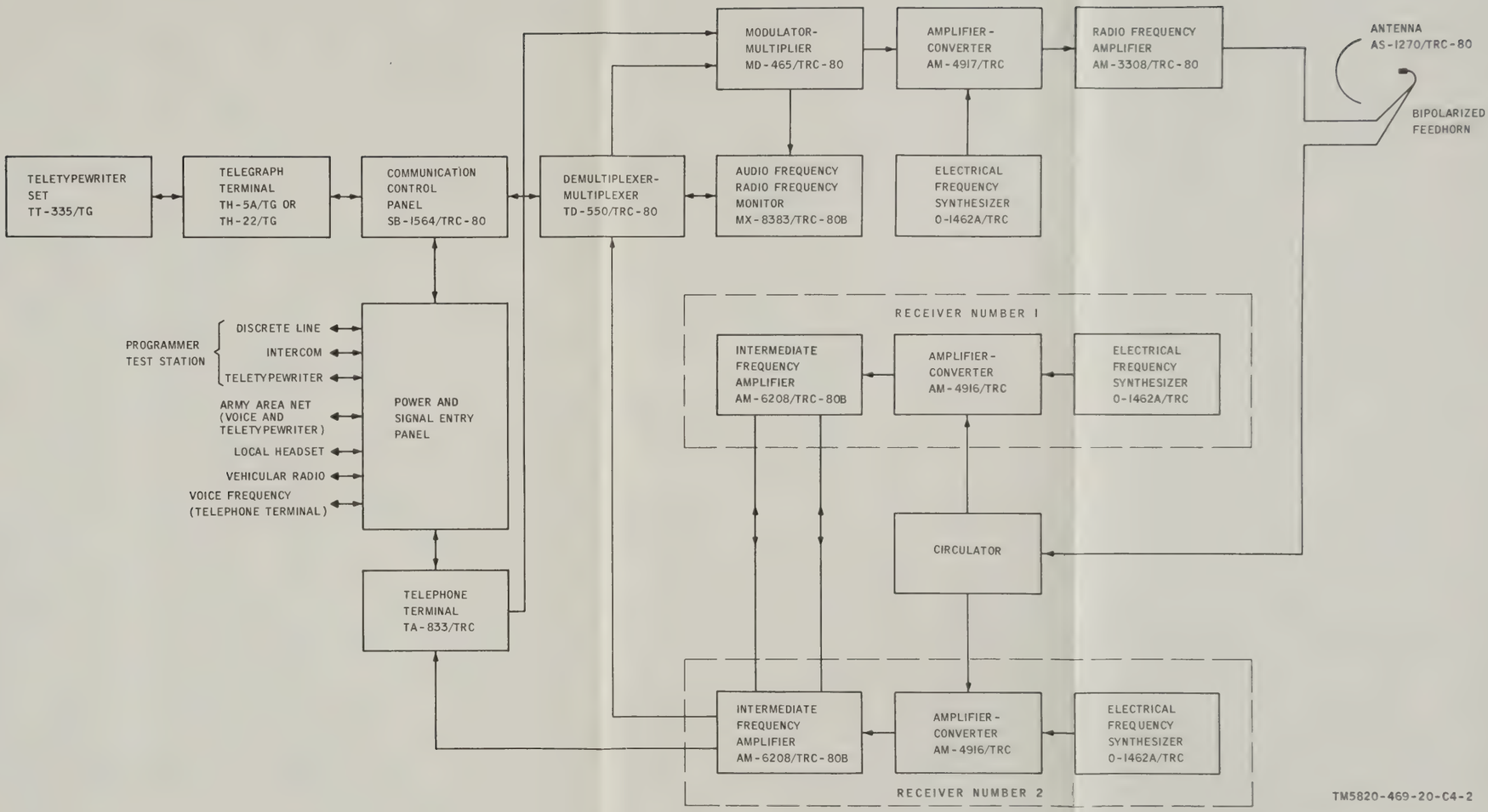
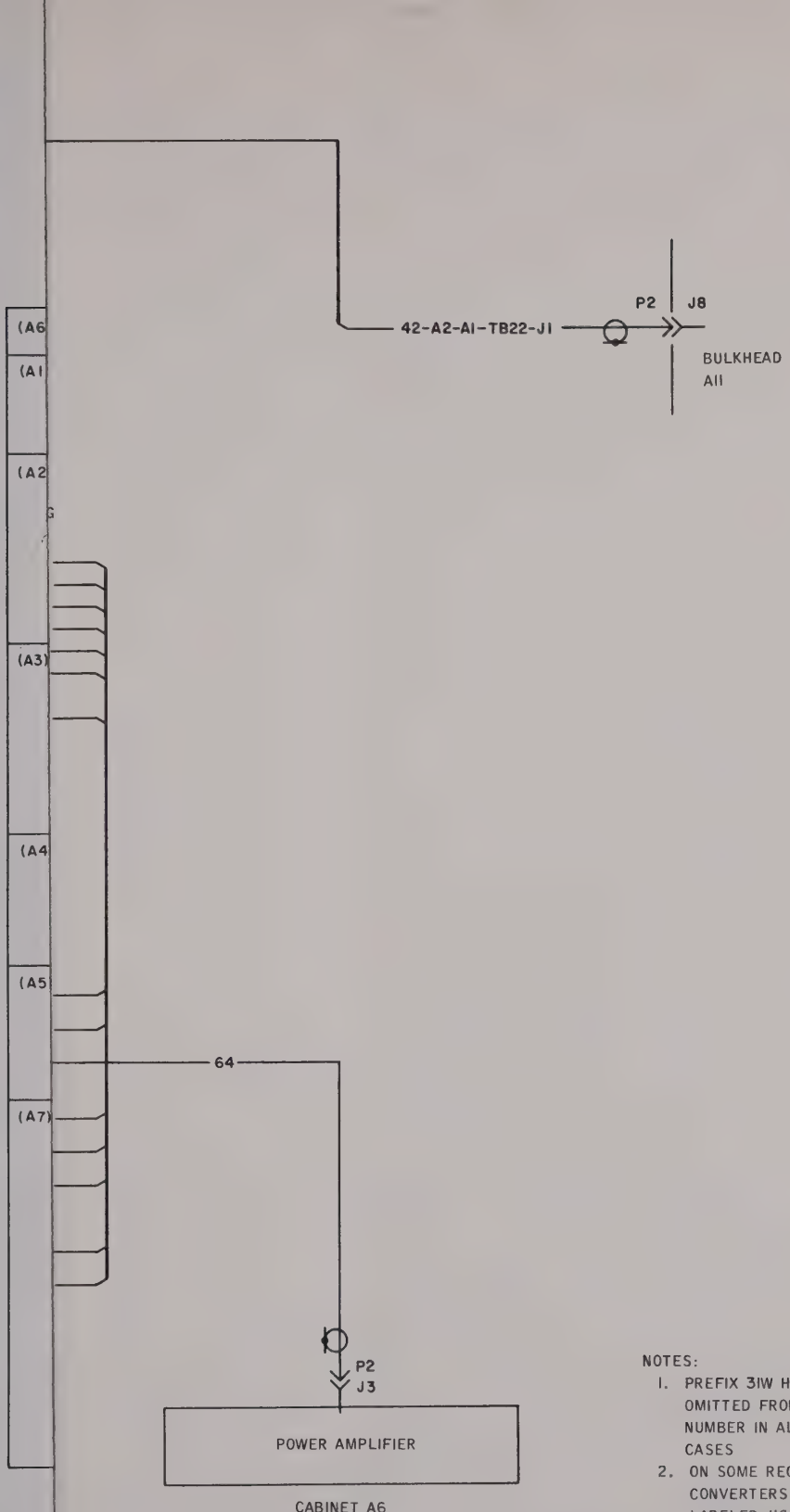


Figure 38. Radio Terminal Set AN/TRC–80B, simplified block diagram.



NOTES:

1. PREFIX 31W HAS BEEN OMITTED FROM CABLE NUMBER IN ALL CASES
2. ON SOME RECEIVE CONVERTERS J2 IS LABELED J16 AND J3 IS LABELED J17

TM5820-469-20-C4-1

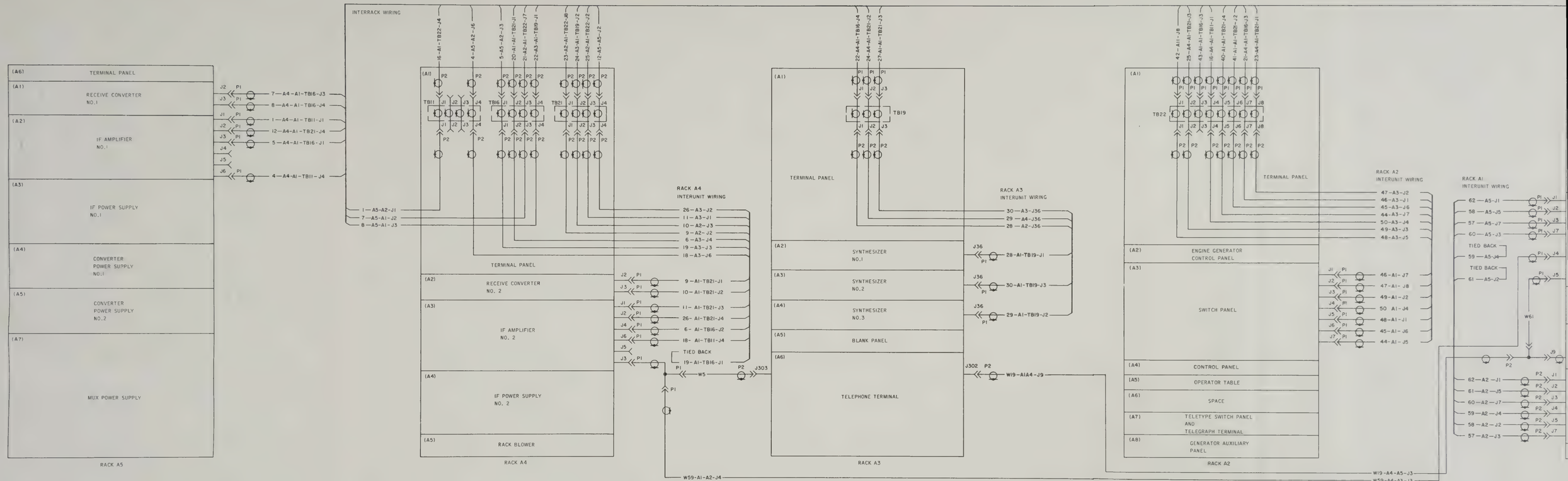


Figure 39. Coaxial cable diagram.

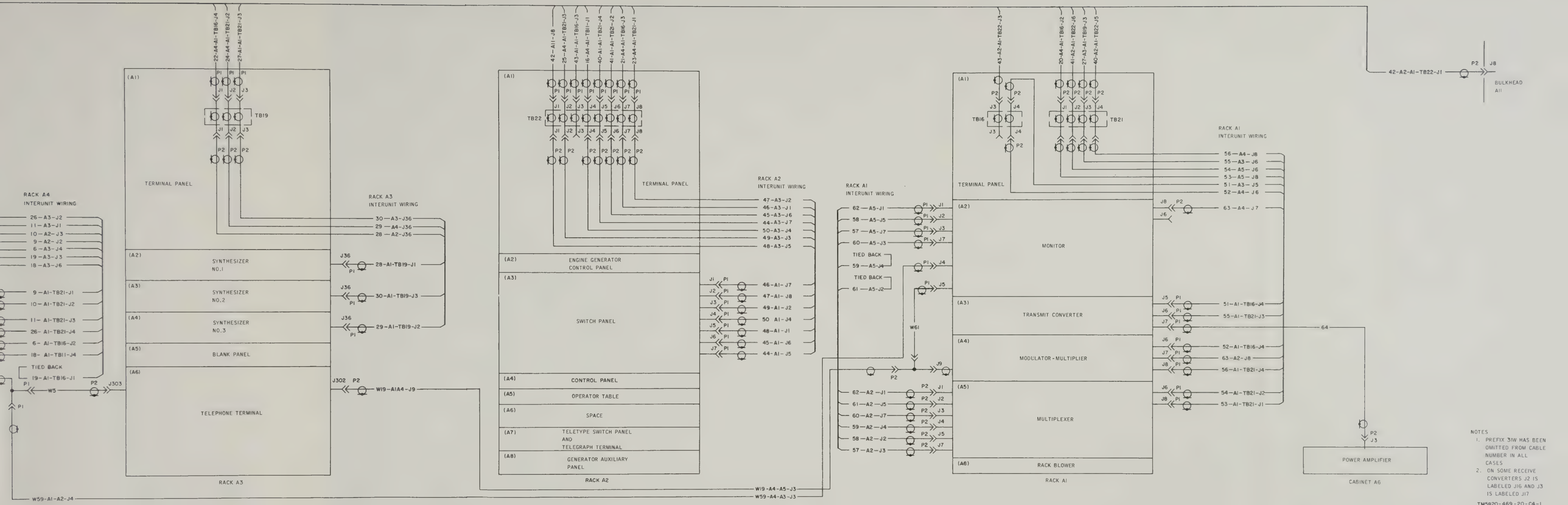
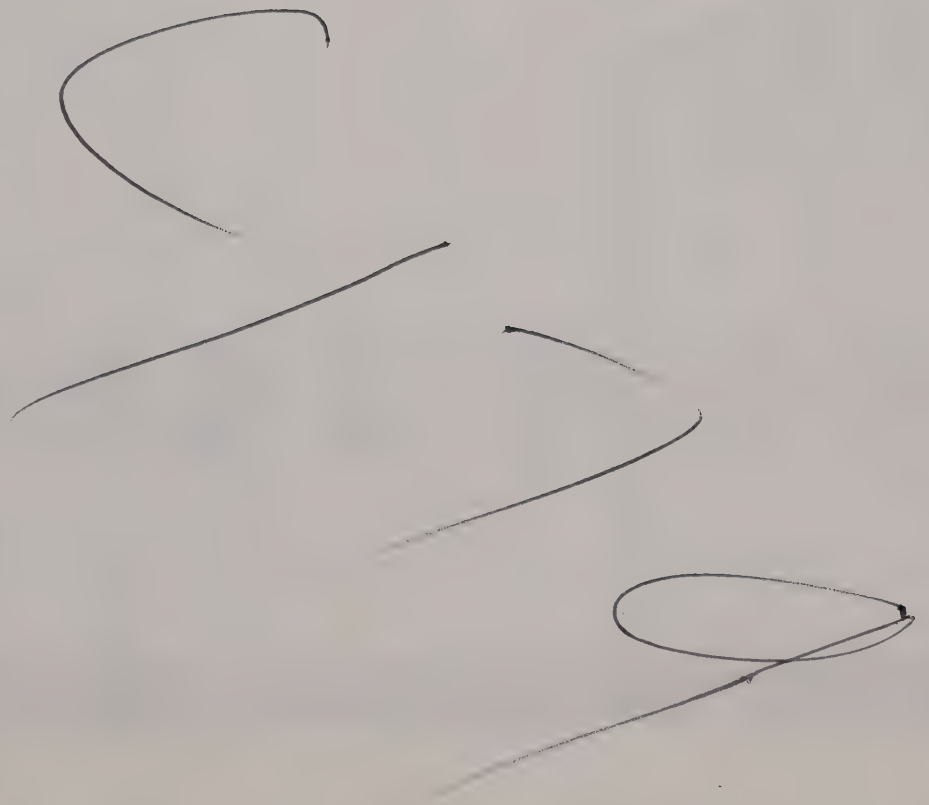


Figure 39. Coaxial cable diagram.



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HEADQUARTERS
DEPARTMENT OF THE ARMY
WASHINGTON, D.C., *23 January 1969*

mk 4-15-69

Organizational Maintenance Manual

RADIO TERMINAL SETS AN/TRC-80 and AN/TRC-80A

TM 11-5820-469-20, 26 June 1963, is changed as follows:

1. This change changes the manual so that it also applies to the following equipment:

Nomenclature	*Order No.*
Radio Terminal Set AN/TRC-80A	DAABO5-67-C-0178 and DAABO5-67-C-0179

2. The title of the manual is changed as shown above.

3. This change includes organizational maintenance for the AN/TRC-80 and AN/TRC-80A. It also reflects equipment modifications on the AN/TRC-80 incorporated by MWO 11-5800-207-30/1.

---

*This change supersedes C 2, 18 February 1965.

15

4. On page 2 of cover change warning notice to read as follows:

WARNING

Be careful when working on the 200-volt dc high-voltage circuits, or on the 120- and 208-volt ac line connections.

DON'T TAKE CHANCES!

DANGEROUS RF VOLTAGES ARE EXPOSED ON THE ANTENNA.

EXTREMELY HIGH VOLTAGES EXIST IN THE FOLLOWING UNITS:

Klystron drawer .....7,700 volts

Amplifier-Converter AM-3303/TRC-80..1,600 volts

Amplifier-Converter AM-4917/TRC ...1,600 volts

5. Remove old pages and insert new as indicated below.

Remove—	*Insert—*
1 and 2	1 and 2
3 and 4	3 and 4
	6.1 and 6.2 (blank)
7 through 16	7 through 16.3
19 and 20	19 and 20.1
21 and 22	21 and 22.2
23 and 24	23 to 24.2
25 through 30	25 through 30
31 through 34	31 through 34.3
37 and 38	37, 38, and 38.1
39 and 40	39, 40, and 40.1
45 and 46	45, 46, and 46.1
47 and 48	47, 48, and 48.1
51 through 56	51 through 56
59 through 64	59 through 64.1
65 and 66	65 and 66.1
	76.1 (fig. 38.1)
	78.1 (fig. 39.1)

6. File this change sheet in the front of the manual.

By Order of the Secretary of the Army:

W. C. WESTMORELAND,
General, United States Army,
Chief of Staff.

Official:
KENNETH G. WICKHAM,
Major General, United States Army,
The Adjutant General.

Distribution: To be distributed in accordance with DA Form 12-51 (qty rqr Block #450), Organizational maintenance requirements for AN/TRC-80 radio set.

☆ U.S. GOVERNMENT PRINTING OFFICE: 1969—344444/210

*TM 11-5820-469-20

TECHNICAL MANUAL
No. 11-5820-469-20

HEADQUARTERS,
DEPARTMENT OF THE ARMY
WASHINGTON, D.C. 20315, *26 June 1963*

RADIO TERMINAL SETS AN/TRC-80 AND AN/TRC-80A

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CHAPTER 1.	INTRODUCTION	1, 2	2
2.	MAINTENANCE INSTRUCTIONS		
Section I.	Maintenance checks and services	3-9	3-9
II.	Cleaning and lubrication	10-12	10-12
CHAPTER 3.	TROUBLESHOOTING		
Section I.	Organization of troubleshooting procedures	13, 14	19
II.	Sectionalization of troubles	15-20	19-25
III.	Localization of troubles	21-33	26-38
IV.	Coaxial cables and connections	34-39	42-48
CHAPTER 4.	REPAIRS AND ADJUSTMENTS		
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II.	Tube testing and replacement	49, 50	60
III.	Adjustments and repair procedures	51-53	61-63
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*This manual supersedes TM 11-5820-469-20, 2 April 1962.

CHAPTER 1

INTRODUCTION

Note. Radio Terminal Set AN/TRC-80A is similar to Radio Terminal Set AN/TRC-80. Information in this manual applies to both unless otherwise specified.

1. Scope

a. This manual covers organizational maintenance of Radio Terminal Set AN/TRC-80. The installation and operation of this equipment is covered in TM 11-5820-469-10.

b. Organizational maintenance for Radio Terminal Set AN/TRC-80 consists of the following:

(1) Preventive maintenance (para 4).

(2) Monthly checks and services (para 5 and 6).

(3) Quarterly checks and services (para 7 and 8).

(4) Lubrication (para 11).

(5) Cleaning and replacement of air filters (para 10 and 12).

(6) Troubleshooting (para 13 through 33).

(7) Coaxial cables and connections (para 34 through 39).

(8) Removal and replacement procedures (para 40 through 48).

(9) Tube testing and replacement procedures (para 49 and 50).

(10) Repairs and adjustments (para 51 through 53.1).

c. Refer to TM 11-5820-469-10 for nomenclature and common name assignments used throughout this manual.

2. Indexes of Publications

a. DA Pam 310-4. Refer to the latest issue of DA Pam 310-4 to determine whether there are new editions, changes, or additional publications pertaining to the equipment.

b. DA Pam 310-7. Refer to DA Pam 310-7 to determine whether there are modification work orders (MWO's) pertaining to the equipment.

2.1. Reporting of Equipment Manual Improvements

The reporting of errors, omissions, and recommendations for improving this publication by the individual user is encouraged. Reports should be submitted on DA Form 2028 (Recommended Changes to DA Publications) and forwarded direct to Commanding General, U.S. Army Electronics Command, ATTN: AMSEL-ME-NMP-AD, Fort Monmouth, N. J., 07703.

CHAPTER 2

MAINTENANCE INSTRUCTIONS

Section I. MAINTENANCE CHECKS AND SERVICES

3. Tools, Materials, and Test Equipment Required

A list of parts normally stocked for organizational maintenance is contained in TM 11-5820-469-20P. The materials and tools required for organizational maintenance are listed below. The test equipment authorized for organizational maintenance is listed in the allocation of tools for maintenance functions section of the maintenance allocation chart (appx II).

a. Tools.

(1) Tool Kit, Radio Repair, TK-115/G.
(2) Key wrench, 5/16-inch hexagonal (supplied with AN/TRC-80).
(3) Key wrench, 1/2-inch hexagonal (supplied with AN/TRC-80).

b. Materials.

(1) Cleaning Compound (Federal stock No. 7930-395-9542).
(2) Cleaning cloth.
(3) Lubricating Oil, Instrument (OAI) MIL-L-6085 (Federal stock No. 9150-257-5449).
(4) Lubricating Oil, General Purpose VV-L-820 (Federal stock No. 9150-252-6174).
(5) Grease, Aircraft and Instrument (GL) MIL-G-3278.
(6) Lubricating Oil, General Purpose MIL-L-7870 (Federal stock No. 9150-263-3490).
(7) Fine sandpaper.
(8) Detergent.
(9) Antenna repair kit (Collins part No. 024-0296-00).
(10) Grease, Aircraft, MIL-G-25760 (Federal stock No. 9150-656-1501).

4. Preventive Maintenance

a. Preventive maintenance is the systematic care, inspection, and servicing of equipment to maintain it in serviceable condition, prevent breakdowns, and assure maximum operational capability. Preventive maintenance is the responsibility of all personnel concerned with the equipment and includes the inspection, testing, and repair or replacement of parts, subassemblies, or units that inspection and tests indicate would probably fail before the next scheduled periodic service. Preventive maintenance service and inspections of the AN/TRC-80 are made at monthly and quarterly intervals unless otherwise directed by the commanding officer. The maintenance services should be scheduled concurrently with the periodic service schedule of the remaining components of the Pershing Weapons System.

b. Maintenance forms and records to be used and maintained on this equipment are specified in TM 38-750.

5. Monthly Maintenance

Perform the maintenance functions indicated in the monthly preventive maintenance checks and services chart (para 6) once each month. A month is defined as approximately 30 calendar days of 8-hour-per-day operation. If the equipment is operated 16 hours a day, the monthly preventive maintenance checks and services should be performed at 15-day intervals. Adjustment of the maintenance interval must be made to compensate for any unusual operating conditions. Equipment maintained in a standby (ready for immediate operation) condition must have monthly preventive maintenance checks and services performed on it. Equipment in limited storage (requires service before operation) does not require monthly preventive maintenance.

6. Monthly Preventive Maintenance Checks and Services Chart

Seq. No.	Item	Procedure	References
1	Liftscrew lubrication----------	Lubricate the liftscrew (para 11*b*, b.1, and fig. 1).	Para 51.
2	Antenna elevation jackscrew lubrication.	Lubricate the jackscrew (para 11*c* and fig. 2).	None.
3	Azimuth mechanism lubrication --	Lubricate the azimuth mechanism (para 11*d* and fig. 3).	None.
4	Antenna platform locking pins lubrication.	Lubricate the antenna platform locking pins (para 11*e* and fig. 4).	Para 52.
5	Mesh-type filter cleaning -------	Clean the mesh-type metal filter elements located in the evaporator unit of air conditioner, and rack blower (para 10*b*).	Para 12.
6	Fiberglass filter cleaning -------	Clean the fiberglass filter elements located in the power amplifier (para 10*c*).	Para 12.
7	Engine generator service -------	Check the oil level on the dipstick	Refer to the instruction book issued with the engine generator, and lubricate the engine generator as directed.
8	Battery----------	Check the electrolyte level of the battery. Use the multimeter to check the battery voltage under load.	None.
9	Liftscrew chain ----------	Inspect the liftscrew chain for visible sag. If sag is noted, tighten the chain by following the procedure in paragraph 51.	Fig. 37.
10	Platform antenna locks ---------	Check to see that all four antenna platform locking handles lock in the elevated or retracted position. Perform the antenna liftscrew adjustment (para 52) if any of the antenna platform locking handles will not lock.	None.
11	Antenna bag----------	Check the antenna bag for tears or leaks.	Para 53.

7. Quarterly Maintenance

Quarterly preventive maintenance checks and services on the AN/TRC-80 are required. The periodic daily and monthly services constitute a part of the quarterly preventive maintenance checks and services and must be performed concurrently. All deficiencies or shortcomings will be recorded in accordance with the requirements of TM 38-750. Perform all the checks and services listed in the quarterly preventive maintenance checks and services chart (para 8) in sequence.

8. Quarterly Maintenance Checks and Services Chart

Seq. No.	Item	Procedure	References
1	Completeness ----------	Check to see that the equipment is complete (appx II, TM 11-5820-469-10).	None.

Seq. No.	Item	Procedure	References
2	Installation ----------	See that the equipment is properly installed (para 23 and 24, TM 11-5820-469-10).	None.
3	Cleanliness ----------	See that the equipment is clean (para 81, TM 11-5820-469-10).	Para 10.
4	Obvious defects ----------	Inspect the items listed in paragraph 9 for obvious defects.	None.
5	Publications ----------	See that all publications are complete, serviceable, and current.	DA Pam 310-4.
6	Modifications ----------	Check DA Pam 310-4 to determine if new applicable MWO's have been published. All URGENT MWO's must be applied immediately. All ROUTINE MWO's must be scheduled.	TM 38-750 and DA Pam 310-4.
7	Flexible waveguides ----------	See that waveguides and connectors are free of sand and dirt (para 81, TM 11-5820-469-10).	None.
8	Lubrication ----------	Lubricate the equipment (para 11)	None.
9	Air filters ----------	Clean the air filters (para 10) ---	Para 12.
10	Pluckout items ----------	Inspect the clamps and seating of pluckout items. Check for wrong, bent, or broken parts.	None.
11	Spare parts ----------	Check all spare parts (operator and organizational) for general condition and method of storage. There should be no evidence of overstock, and all shortages must be on valid requisitions.	Appx II, TM 11-5820-469-10; and TM 11-5820-469-20P.
12	Antenna fabric----------	See that the antenna bag is free of cuts or tears.	Para 53.
13	Fuses --- ----------	See that the fuses in use, and the spares, are of the correct value as indicated in TM 11-5820-469-10.	Para 83, TM 11-5820-469-10.
14	Connections ----------	Check the connections to the engine generator and fuel line. Check the connections to remote facilities and army area net (para 24, TM 11-5820-469-10).	Para 9.
15	Knobs, dials, and switches -----	While making the operating checks (items 17 through 35), observe that the mechanical action of each knob, dial, and switch is smooth and free of external or internal binding. *Caution:* **Do not rotate the tuning or levels controls when these controls are preset for operation at a specific frequency. *Touch only those controls* that are part of the normal operation check.**	Para 26 through 52, TM 11-5820-469-10.
16	Engine generator ----------	Refer to the instruction book issued with the engine generator and see that the oil level on the dipstick is correct and that all lubrication points are correctly lubricated.	

Seq. No.	Item	Procedure	References
17	Engine generator start ------ --	Turn on the engine generator (para 55, TM 5820-469-10). See that the OIL PRESSURE light on the starting panel is out.	Para 16 and 23.
18	Engine generator control panel --	*a.* Check to see that the HEAD TEMPERATURE, OIL PRESSURE, OVER VOLTAGE, UNDER VOLTAGE, OVER FREQUENCY, and UNDER FREQUENCY panel lights are all out; and that the battery ammeter indicates a slight charge, the voltmeter indicates 208 volts, and the frequency meter indicates 400 cps. *b.* Set the LOAD CONTROL switch to ON and observe that the POWER ON indicator lights.	Para 23*a* and *b*.
19	Circuit breaker panel ----------	Set the MAIN BREAKER, RACK POWER, FLUSHING BLOWER and the AIR COND circuit breakers to ON. Note that all circuit breakers remain at ON.	Para 16.
20	Switch panel ----------	*a.* Turn the HUT LIGHTS and FLUSHING BLOWER switches on, and note that the HUT LIGHTS, FLUSHING BLOWER and AIR FAILURES lights come on. *b.* Turn on the RACK POWER switch and see that the blowers come on and, after a slight delay, the AIR FAILURES indicator goes off.	*a.* Para 24. *b.* Para 24.
21	Control panel ----------	Depress the POWER pushbutton, and note that the panel pushbutton lamps light.	Para 84, TM 11-5820-469-10.
22	Rack A1 ----------	Turn on the (filament and B+) power switches in the transmit converter, modulator-multiplier, and multiplexer. Note that the filament indicator lamps on the transmit converter, modulator-multiplier, and multiplexer light. After a 30-second delay, the TIME DELAY and B+ indicators light. Observe that AIR FAILURE RACK 1 lamp on the switch panel is off.	Para 24, item 5.
23	Rack A3 ----------	Turn the PWR switches on the three synthesizer units to ON. Observe that the FIL indicators light and OVEN indicators on oscillators No. 2 and No. 3 light. After slight delay, TIME DELAY and B+ indicators light. OVEN indicators start cycling on and off. Note that the AIR FAILURE RACK 3 lamp on the switch panel is off.	Para 24, item 6.

Seq. No.	Item	Procedure	References
23.1	Rack A3 (AN/TRC-80A only).	Turn the POWER switches on the three synthesizer units to ON. Check that the power indicator on the fault panel lights.	Para 27.1, item 1.

Seq. No.	Item	Procedure	References
24	If. power supplies (rack A4 and A5).	Set the POWER switches to ON and observe that the POWER indicators light. After slight delay, the TIME DELAY and POWER SUPPLIES indicators should light. Note that AIR FAILURE RACKS 4 and 5 lamp on the switch panel is off.	Para 24, item 7.
25	Antenna	Erect and inflate the antenna (para 57, 58, and 59, TM 11-5820-469-10). Observe that the antenna bag inflates normally and is correctly orientated in azimuth and elevation.	Para 53.
26	Frequency selection and tuning ..	Tune both receivers and the transmitter to the desired frequency settings (para 60 through 66 of TM 11-5820-469-10). Note that all tuning controls are set to approximately the desired frequencies. All meter indications are within normal limits.	TM 11-5820-469-10
27	Radio circuit operation (AN/TRC-80 to AN/TRC-80).	Operate the controls listed below: *a.* Press the DISCRETE pushbutton and note that the DISCRETE pushbutton illuminates green. *b.* Press the DISCRETE LINE SEL pushbutton and note that the ARMY (lower) portion of the pushbutton illuminates. **Note.** The discrete line is now connected to the Army area net. *c.* Press the COMMAND pushbutton and note that the COMMAND pushbutton illuminates green. *d.* Press the VF TTY pushbutton and note that the COMMAND (upper portion) of the pushbutton illuminates green. *e.* Set the TH-5A/TG or TH-22/TG switches at NORM and 4W. *f.* On the teletypewriter switch panel, set the OPERATING MODE switch to NORMAL DC LOOP. *g.* Press the RING pushbutton and note that the RING pushbutton flashes white. (This action signals distant AN/TRC-80 operator.) *h.* Push the headset push-to-talk button to talk; release to listen. The distant operator's voice should be clearly audible. *i.* Operate the teletypewriter equipment and observe that the teleprinter prints either transmit or receive copy.	Para 33, item 1. Para 33, item 1.
28	Programmer test station radio circuit.	**Note.** This action will set up combined speech and teletypewriter circuit between local pts facility and the distant AN/TRC-80. Position the following controls: *a.* Press the DISCRETE LINE SEL pushbutton and observe that the COMMAND (upper) portion of the pushbutton illuminates. *b.* Press the COMMAND pushbutton and observe that the COMMAND (amber) light becomes brighter. *c.* Press the VF TTY pushbutton and observe that the COMMAND (upper) portion of the pushbutton illuminates.	

Seq. No.	Item	Procedure	References
		d. Set the TH-5A/TG or TH-22/TG switches to NORM and 4W. *e.* Set the teletypewriter switch panel OPERATING MODE switch at VF 2W/4W and the PTS-BY PASS switch at ON. *f.* Note that teletypewriter and voice communication between pts and distant AN/TRC-80 operator is normal.	Para 33, item 2.
29	Three-party (army area net, pts, and local operator) dc teletypewriter circuit.	**Note.** Setting up this three-party circuit disrupts the radioteletypewriter operation. Set the following controls: *a.* Press the DC TTY pushbutton and note that the ARMY AND PTS (lower) portion of the pushbutton lights. *b.* On the teletypewriter switch panel, place the OPERATING MODE switch at NORMAL DC LOOP and the PTS-BY PASS switch to OFF. *c.* On the TH-5A/TG or TH-22/TG set the switches to NORM and 4W. *d.* Operate the teletypewriter equipment and check to see that three-party telewriter communication between the army area net, pts, and local operator is possible.	Para 33, item 3.
30	Army four-wire-two-wire vf tty circuit operation.	*a.* Press the VF TTY pushbutton and note that the ARMY (lower) portion of pushbutton lights. *b.* Note that teletypewriter communication between the Army area net and local operator is possible.	Para 33, item 5.
31	Army-local AN/TRC-80 telephone circuit operation.	Operate the pushbuttons on the control panel as follows: *a.* Press the DISCRETE LINE SEL pushbutton and note that the COMMAND (upper) portion of the pushbutton lights. *b.* Press the ARMY pushbutton and note that the ARMY (green) light becomes brighter. *c.* Press the RING pushbutton and note that it flashes white. *d.* Press the headset push-to-talk button to talk; release to listen. The army operator's voice should be clearly audible.	Para 33, item 4.
32	Local operator-pts speech circuit operation.	**Note.** Setting up this circuit does **not** disrupt any existing teletypewriter circuits. *a.* Press the DISCRETE pushbutton and note that it lights green. *b.* Press the RING pushbutton and note that it flashes white. *c.* Press the headset push-to-talk button to talk; release to listen. The pts operator's voice should be clearly audible.	Para 33, item 6.
33	Pts-local operator intercom circuit operation.	*a.* Press the INTERCOM pushbutton and note that the INTERCOM (green) light becomes brighter. *b.* Press the headset push-to-talk button to talk; release to listen. The pts operator's voice should be clearly audible.	Para 33, item 7.

Seq. No.	Item	Procedure	References
34	Local operator-remote vehicle speech circuit operation.	*a.* Press the VEHICLE pushbutton and note that the VEHICLE (green) light becomes brighter. *b.* Press the headset push-to-talk button to talk; release to listen. The distant vehicle operator's voice should be clearly audible.	Para 33, item 8.
35	Answering calls (An incoming call is indicated by a flashing pushbutton or a voice call).	*a.* Press the desired pushbutton (INTERCOM, VEHICLE ARMY, COMMAND, or DISCRETE) to complete the circuit. Note that the selected indicator stops flashing. *b.* Press the headset press-to-talk pushbutton to talk; release to listen. The distant operator's voice should be clearly audible.	Para 20.

9. Visual Inspection

This inspection should be performed as part of the quarterly maintenance checks and services inspection (para 8, sequence 4).

Warning: **Obtain permission to turn off all power (except the hut lights) before performing the following inspection. Before touching an exposed electrical part, short-circuit the part to ground with a shorting stick.**

a. Air Ducts. Check the klystron blower ducts and clamps for proper fit and condition. Check the condition and fit of the molded rubber ducts on the rack blowers in racks A1, A3, and A4.

Note. In all Radio Terminal Sets AN/TRC-80A, Coolers, Air, Electronic Equipment HD-545/TRC-80 (blowers) have been removed from rack A3.

b. Coaxial Connectors. Check the coaxial cable connectors for proper fit and cleanliness.

c. Power Amplifier Interlock Circuit. See that the three drawers in the power amplifier cabinet fit snugly to insure continuity of the interlock circuit.

d. Air Vents. Inspect the gaskets of the hinged exterior power amplifier (pa) vents and the preheat port for leaks and worn spots.

e. Motors. Inspect the rack-mounted blowers and the antenna air compressor and blower for overheating, dirt, and loose connections.

Warning: **Never stand on the shelter roof when the power amplifier is on.**

f. Antenna Mechanism. Check the operation of the antenna azimuth and elevation adjustment mechanism and the footbrake and azimuth-locking mechanism.

g. Coaxial Resonators. Inspect the mechanical portions of the variable coaxial resonators in the transmit and receive converters for cleanliness.

h. Capacitors. Inspect the electrolytic capacitors for leakage and bulging cases.

Section II. CLEANING AND LUBRICATION

10. Cleaning

a. General. Inspect the equipment in the operator's compartment, the engine generator compartment, and the antenna compartment. The equipment should be free of dirt, grease, and fungus. Paragraph 81 of TM 11-5820-469-10 covers the items that must be cleaned by the operator. The organizational maintenance man should clean the vitreous or glass surface on the wire-wound resistors with cleaning compound and wash the air filters as specified below. Mesh-type metal and fiberglass filters are used in the radio set. Both types can be cleaned and reused. To clean the filters, follow the procedures in *b* and *c* below. The removal and replacement of air filters is covered in paragraph 12.

b. Cleaning Mesh-Type Metal Air Filters.

Warning: **Prolonged breathing of cleaning compound fumes is dangerous; make certain that adequate ventilation is provided. Cleaning compound is flammable; do not use near a flame. Avoid contact with the skin; wash off any that spills on your hands.**

(1) Immerse the filter in a shallow container filled with cleaning compound.

(2) Agitate the filter to remove all dirt.

(3) Shake off excess cleaning compound, and allow the filter to dry thoroughly.

(4) Spray or paint a very light coating of oil, VV-L-820, on the wire mesh.

c. Cleaning Fiberglass Filters.

(1) Immerse the air filter, with the inlet side up, in a shallow container filled with warm water to which a small amount of detergent has been added.

(2) Agitate the filter to remove all dirt.

Caution: **Never pass a high-pressure stream of water through the filter because this will displace the fibers and impair the efficiency of the filter.**

(3) Rinse the filter in clean water, and allow it to dry.

11. Lubrication

Warning: **Never lubricate the equipment with the power on.**

a. General. Lubrication points for the radio set are shown in figures 1 through 4, 4.1, and 4.2. The lubrication intervals specified below are satisfactory for temperate-zone operation. If the equipment is operated in excessively dusty or humid areas, the lubrication intervals specified must be adjusted to prevent damage or excessive wear of the equipment. *Lubrication is performed only after the radio set is made inoperative.* The types of lubricants used, the lubrication interval, and the lubrication instructions are given in *b* through *e* below. Before performing any of the following lubrication procedures, clean the mechanism with cleaning compound.

Note. The procedures given in *b* below apply to equipment procured on Order No. 4255-PP-61. Refer to *b.1* below for liftscrew lubrication instructions for equipment procured on Order No. 15058-PP-62.

b. Liftscrew Lubrication for Equipment Procured on Order No. 4255-PP-61 (fig. 1). Lubricate the antenna platform liftscrews at 30-day intervals. One liftscrew is located at each corner of the antenna compartment. The liftscrew lubrication procedure is as follows:

(1) If the antenna platform is in the stowed position, raise it as directed in TM 11-5820-469-10.

Note. 1. If it becomes difficult to lock all four of the antenna platform locking handles in either the elevated or lowered positions, refer to paragraph 52.

Note 2. If it is necessary to lubricate the azimuth drive mechanism, perform the procedures in *d* below before proceeding.

Note 3. If it is necessary to lubricate the antenna platform locking pins, perform the procedures in *e*(2) and (3) below before proceeding.

(2) On rack A2, remove the equipment rack-securing screws from the right-hand side of the engine generator control panel, the switch panel, and the control panel (fig. 5, TM 11-5820-469-10).

(3) Swing the panels aside to expose the antenna compartment access hatch.

(4) Loosen the six captive wingbolts, and remove the hatch cover to gain access to the antenna compartment.

(5) Apply a thin coating of grease (GL) to all four liftscrews.

(6) Clean the liftscrew thrust bearing grease fittings located on the bottom flange of each liftscrew.

(7) Apply grease (GL) to the grease fittings of all four thrust bearings.

(8) Apply a light coating of oil, MIL-L-7870 directly to the liftscrew chain.

(9) Replace the antenna compartment hatch covers; swing the engine generator control panel, the switch panel, and the control panel back to their normal positions; and replace the rack-securing screws on the right-hand side of the rack.

b.1. Liftscrew Lubrication for Equipment Procured on Order No. 15058-PP-62 (fig. 1).

(1) Perform the procedures given in *b*(1) above, and refer to the three notes following that subparagraph.

(2) Open the air conditioner door.

(3) Enter the engine generator compartment.

(4) Loosen the dogs that secure the access plate in the center of the engine generator compartment ceiling, and lower the plate to gain access to the antenna compartment.

(5) Lubricate the liftscrew as directed in *b*(5) through (8) above.

(6) Replace and secure the antenna compartment access plate, and close the air conditioner door.

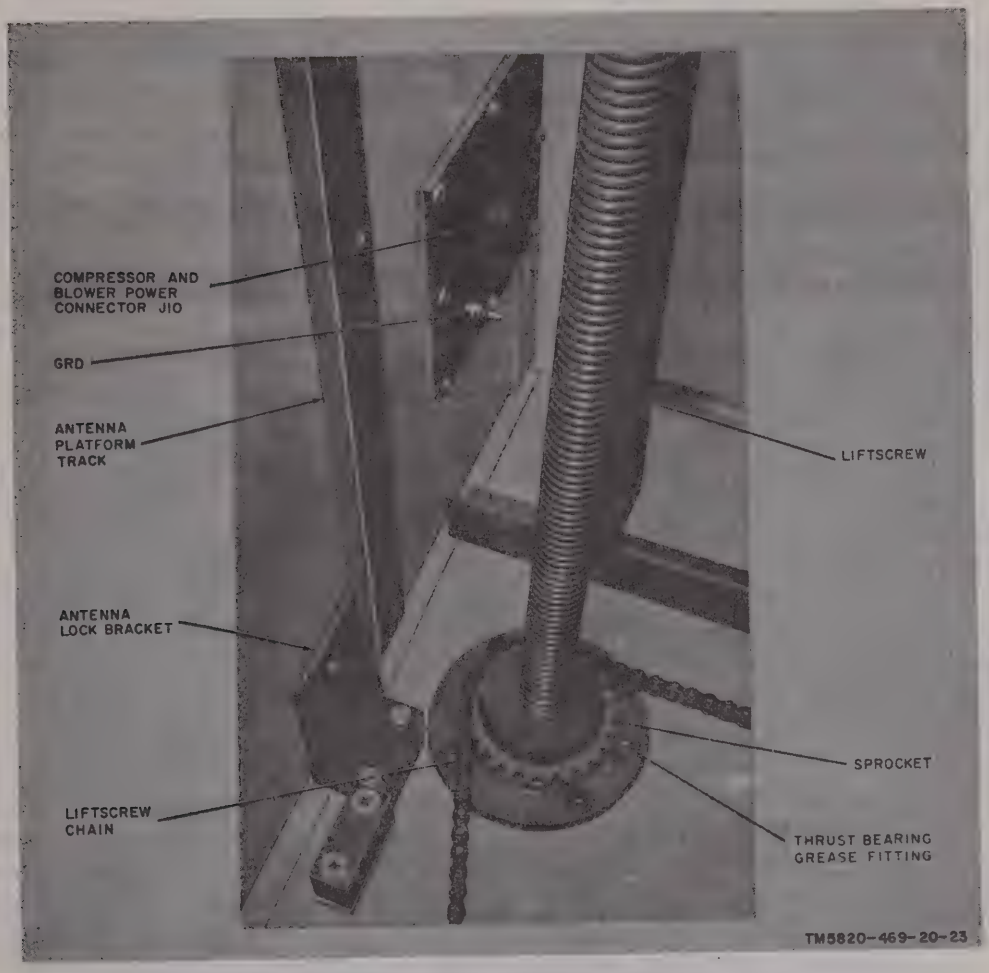

Figure 1. *Antenna platform liftscrew components.*

c. Elevation Jackscrew Lubrication (fig. 2). Lubricate the antenna elevation jackscrew at 30-day intervals. The elevation jackscrew is located at the edge of the antenna platform (fig. 2). The lubrication procedure is as follows:

(1) Remove the fabric protective sleeve (not shown) from the jackscrew.

(2) Clean the jackscrew and apply a coating of grease (GL) directly to the jackscrew threads.

(3) Replace the fabric protective sleeve on the jackscrew.

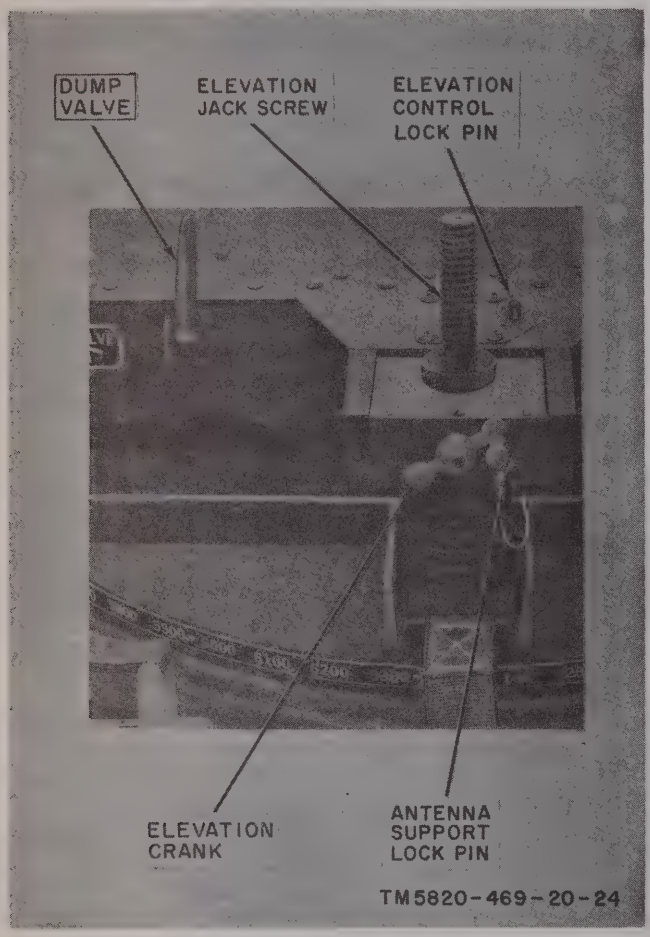

Figure 2. Antenna elevation jackscrew.

d. Azimuth Mechanism Lubrication (fig. 3 and 4). Lubricate the coarse azimuth locking pin and the azimuth drive mechanism at 30-day intervals. The mechanism is located at the periphery of the circular antenna base, near the right front corner of the antenna platform. The lubrication procedure is as follows:

(1) Remove the metal cover from the azimuth drive mechanism (fig. 3) by removing the four securing screws.

(2) Disengage the coarse azimuth locking pin, and rotate the antenna 90°. The azimuth platform should rotate freely.

(3) Apply a thin coat of grease (GL) to the platform drive pin, the drive worm, and the upper bevel gears.

(4) Engage the coarse azimuth locking pin, and replace the cover on the azimuth drive mechanism. Secure the cover with four screws.

(5) Obtain access to the antenna compartment.

Note. For equipments procured on Order No. 4255-PP-61, refer to *b* above. For equipments procured on Order No. 15058-PP-62, refer to *b*.1 above.

(6) Remove the cover from the lower bevel gears (fig. 4 and 4.1).

(7) Insert a 3/8-inch square drive speed handle in the azimuth vernier drive socket (fig. 4.1), and rotate the azimuth platform. Check for free rotation over a range of 100 mils.

(7.1) Apply a thin coat of grease (GL) to the azimuth drive lower bevel gears. Replace the cover on the azimuth drive lower bevel gears.

(8) On equipments procured on Order No. 4255-PP-61, replace the antenna compartment hatch covers; swing the hinged units on rack A2 back to their normal positions, and replace the rack-securing screws.

(9) On equipments procured on Order No. 15058-PP-62, replace and secure the antenna compartment access plate and close the air conditioner door.

e. Antenna Platform Locking Pins Lubrication (fig. 4). The four antenna platform locking mechanisms are lubricated at 30-day intervals. The locking pins and associated mechanisms are located at the four corners of the antenna platform. The lubrication procedure is as follows:

(1) Obtain access to the antenna compartment as instructed in *b* above.

(2) Lower the antenna platform approximately 6 inches to expose the platform locking pin detents (fig. 4).

(3) Apply a light coat of oil, MIL-L-7870, to the antenna platform locking pin mechanism, the locking pin, and the locking pin detent.

(4) Replace the antenna compartment hatch covers; swing the hinged units on rack A2 to their normal positions, and replace the rack-securing screws.

f. Guide Rollers. Check for free rotation of the guide roller (fig. 4.1) at each corner of the antenna platform. Lubricate with oil, MIL-L-870.

g. Antenna Compressor Lubrication (fig. 4.2). The two antenna air compressor grease fittings should be lubricated at intervals of 2,000 hours of operation. The lubrication points are on the lower side of each end of the compressor. The lubrication procedure is as follows:

(1) If the antenna compartment is in the stowed position, raise the antenna compartment (TM 11-5820-469-10).

(2) Remove the compressor drive shaft guard by removing the four bolts securing the guard to the two mounting plates.

(3) Clean the two grease fittings on the compressor.

(4) With a grease gun, add 1/4 ounce of Grease, Aircraft, MIL-G-25760 to each grease fitting.

Caution: **Lubrication in excess of 1/4 ounce per grease fitting can damage the compressor.**

(5) Replace the compressor drive shaft guard by securing with the four bolts.

(6) If required, stow the antenna and lower the antenna compartment (TM 11-5820-469-10).

12. Removal and Replacement of Air Filters

a. Shelter Door Air Filter (fig. 5).

(1) Turn the two cover dogs that hold the filter cover inside the shelter door, and release the cover.

(2) Remove the upper retaining bracket by removing the two bracket screws.

(3) Tilt forward the top of the fiberglass filter element, and lift it out.

(4) Clean and treat the filter element as described in paragraph 10*c*.

(5) Replace the filter element.

(6) Replace the upper retaining bracket with the two bracket screws.

(7) Close the filter cover, and secure it with the two cover dogs.

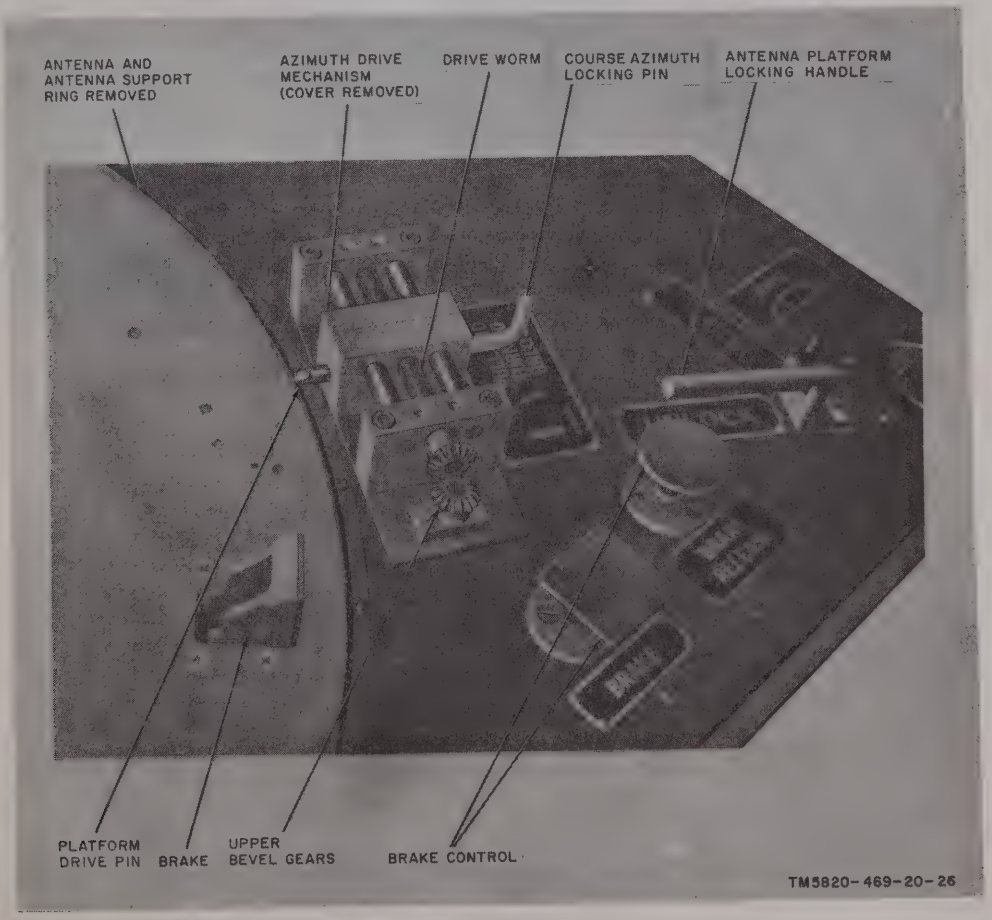

Figure 3. Course azimuth lock and azimuth drive mechanism (cover removed).

b. Power Amplifier (Shelter Vent) Air Filters (fig. 6). An air intake vent for the power amplifier is located on the right front of the shelter (fig. 2, TM 11-5820-469-10). An air exhaust vent is located on the right side of the shelter. Both air vents contain identical fiberglass filters. To remove and replace the filter element, proceed as follows:

(1) Depress the two air vent cover latches, and raise the vent cover.

(2) Loosen the two screw-type bracket fasteners and remove the retaining bracket. (Figure 6 shows the filter with the retaining bracket removed.)

(3) Depress the pin latch button (red) at the right end of the locking pin and remove the locking pin.

(4) Fold out the vent cover support and remove the filter element, bottom end first.

(5) Clean the fiberglass filter element as described in paragraph 10*c*.

(6) Replace the filter element into the vent, and secure the vent cover support with the locking pin.

(7) Replace the retaining bracket, and fasten with the two bracket fasteners.

Caution: **Both air vents must be open (vent cover raised) when the radio set is in operation.**

c. Power Amplifier (Cabinet-Mounted) Air Filter (fig. 7).

(1) Remove the power amplifier control panel drawer as described in paragraph 43*a*.

(2) Remove the retaining bracket by loosening the two screw-type bracket fasteners. (Figure 7 shows the power amplifier filter with the retaining bracket removed.)

(3) Remove the fiberglass filter element by pulling it straight out.

(4) Clean the filter as described in paragraph 10*c*.

(5) Replace the filter in the filter recess.

(6) Replace the retaining bracket, and tighten the two screw-type bracket fasteners.

(7) Replace the power amplifier control panel drawer as described in paragraph 43*b*.

d. Air Conditioner (Evaporator Unit) Air Filter (fig. 8). The two evaporator units contain identical air filters.

(1) Remove the two screws at the bottom of the front cover plate.

(2) Loosen the six captive screw-type fasteners, and remove the cover plate.

(3) Remove the mesh-type filter element by sliding it forward and upward.

(4) Clean the filter as described in paragraph 10*c*.

(5) Replace the filter element.

(6) Replace the cover plate, and start the two screws at the bottom of the cover.

(7) Reset the six captive fasteners.

(8) Tighten the two screws that were replaced in (6) above.

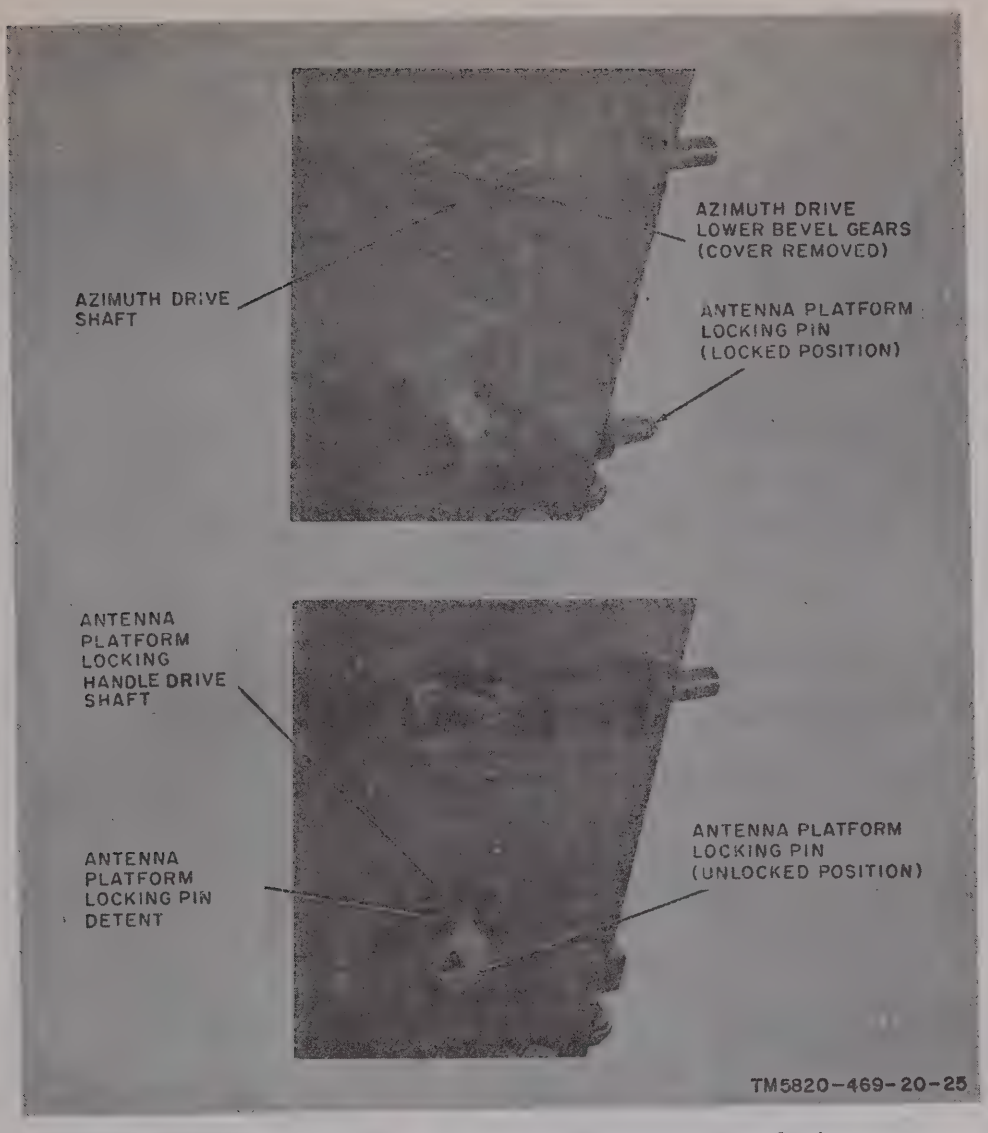

Figure 4. Azimuth drive gears and platform locking mechanism.

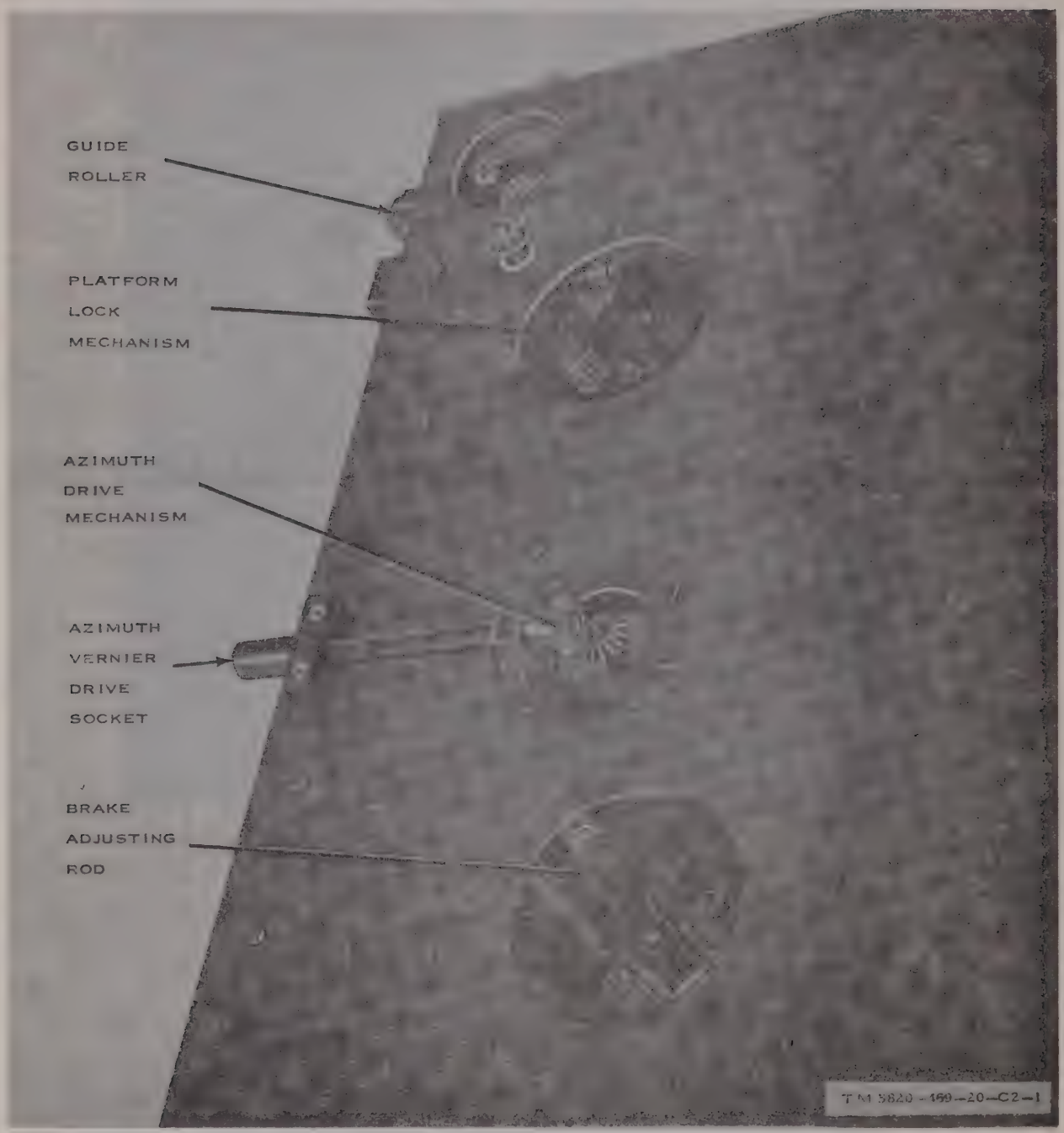

Figure 4-1. Antenna platform components, bottom view.

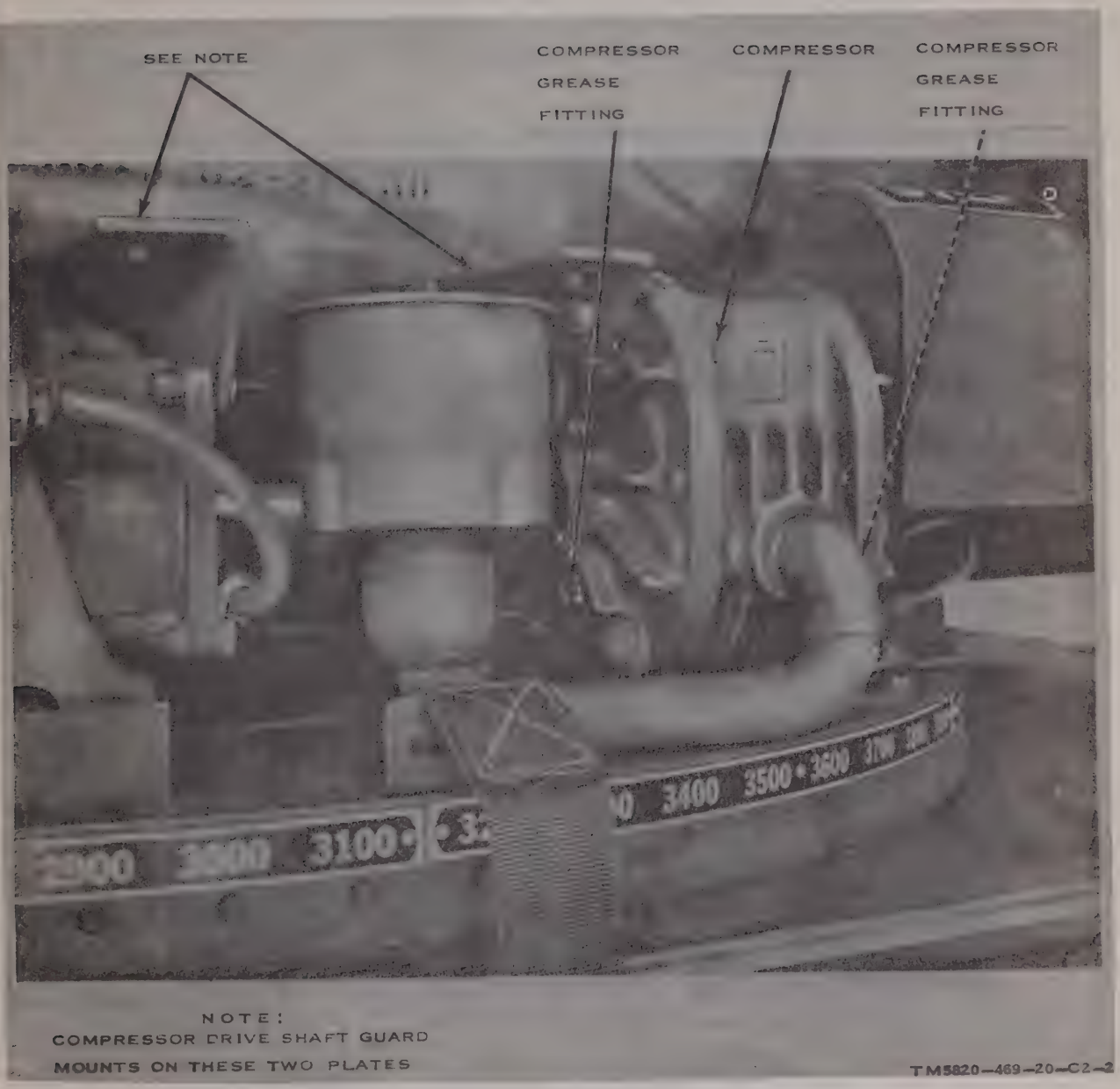

Figure 4-2. Antenna compressor, location of grease fittings.

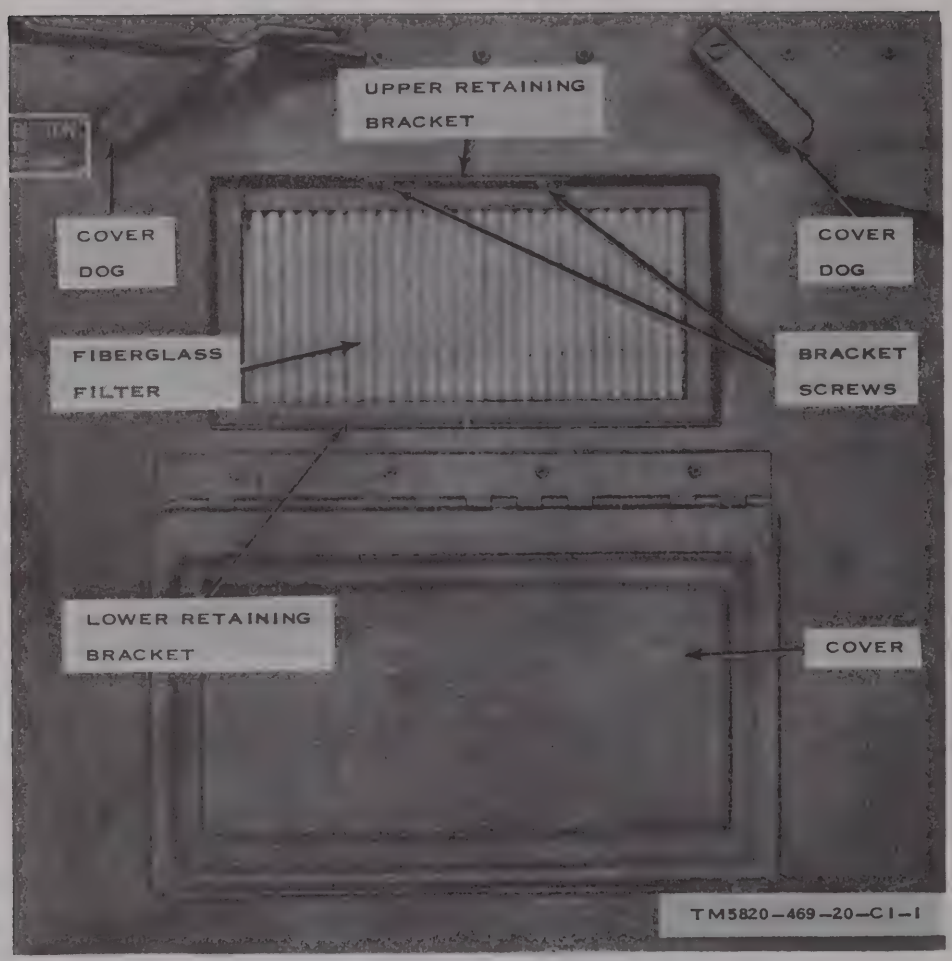

Figure 5. Shelter door filter detail.

e. Rack Blower Air Filters. The three rack blower filters (part of Cooler, Air, Electronic Equipment HD-545/TRC-80) are located at the bases of racks A1, A3, and A4 (fig. 6, 7, and 9, TM 11-5820-469-10). Identical mesh-type metal filter elements are used in the three blowers.

(1) Loosen the four captive screws that secure the filter holder to the blower housing.

(2) Loosen the two screw-type fasteners that secure the retaining frame to the inside of the filter holder, and remove the retaining frame.

(3) Remove the filter element and clean it as described in paragraph 10*b*.

(4) Replace the filter into the filter holder and replace the retaining frame by use of the two screw-type fasteners.

(5) Replace the filter holder on the blower housing and tighten the four captive screws.

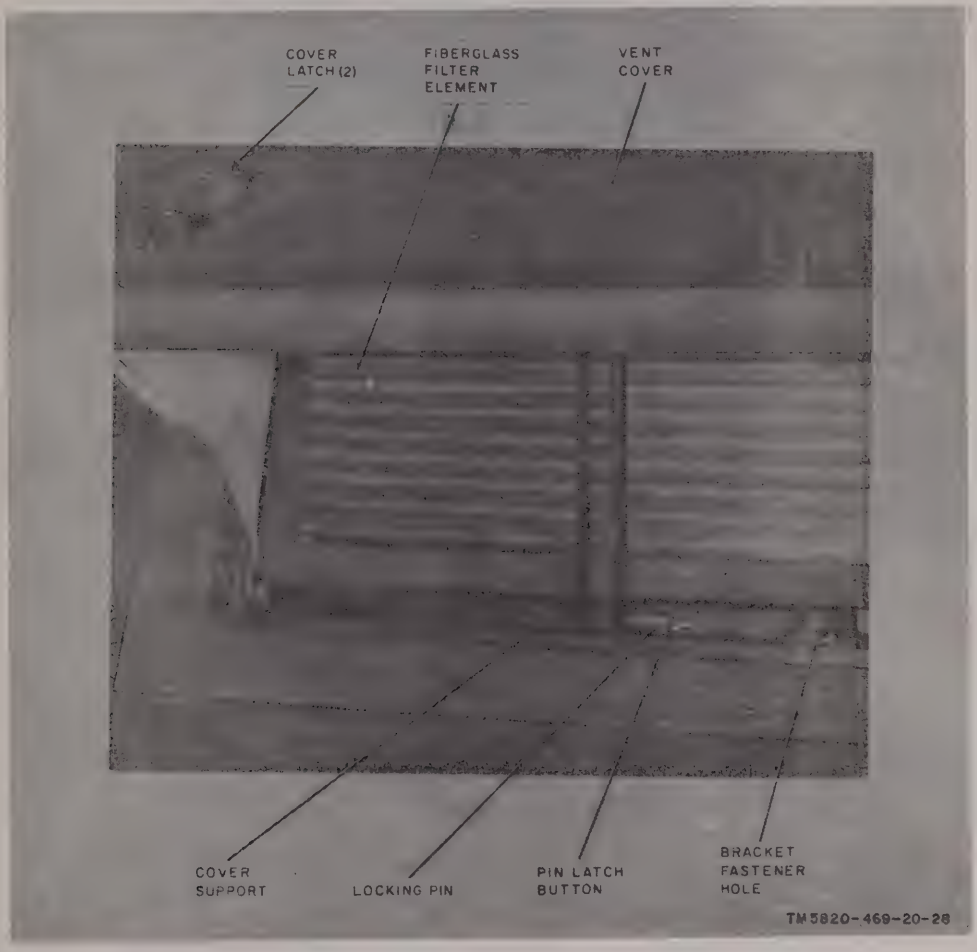

Figure 6. Power amplifier shelter vent filter detail.

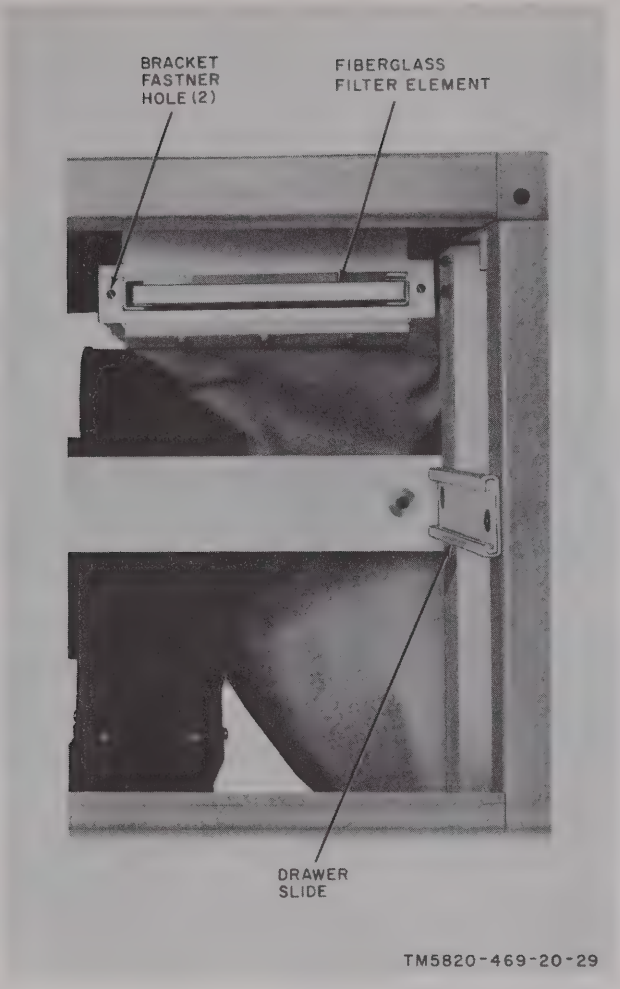

Figure 7. Power amplifier cabinet filter detail.

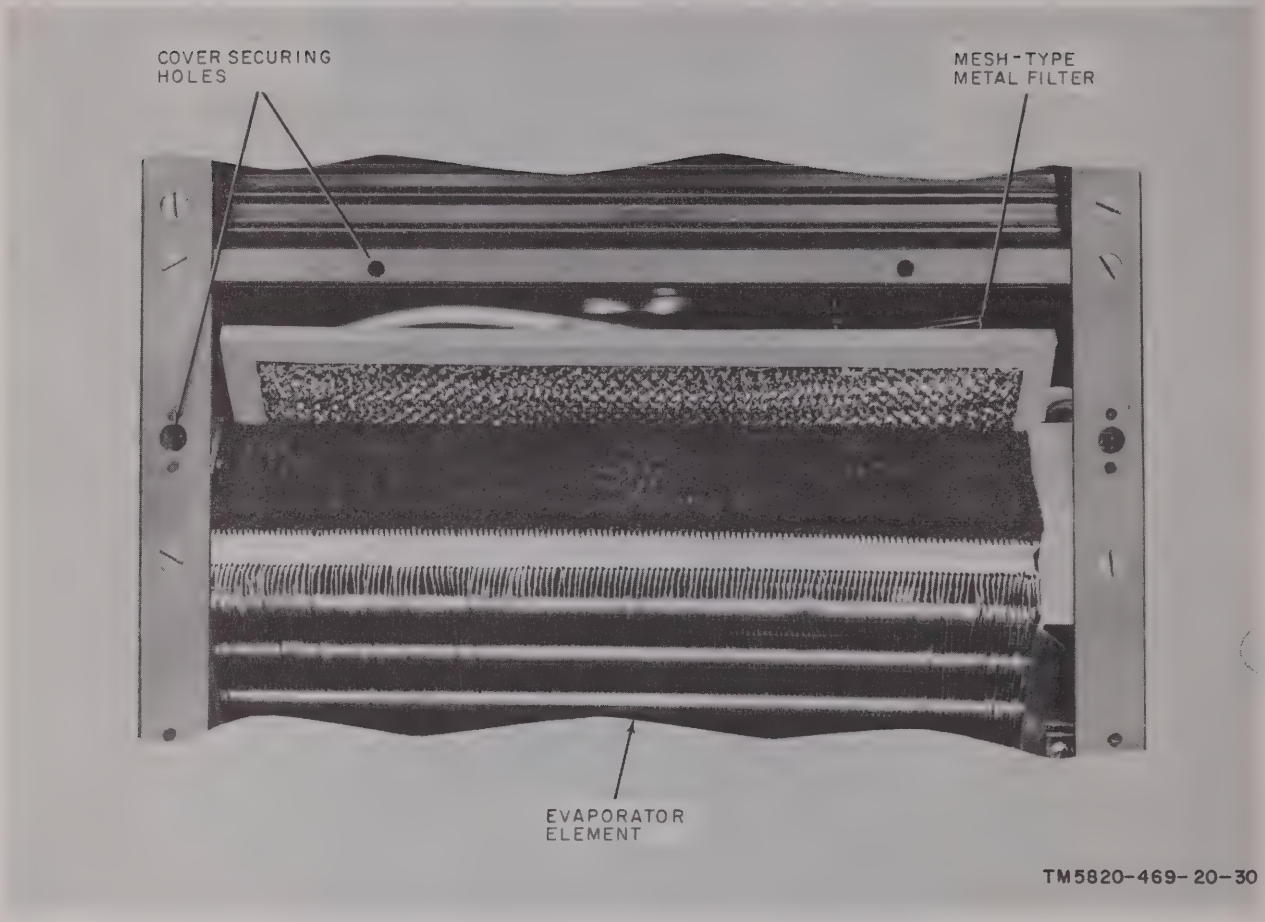

Figure 8. Air conditioner filter detail (front cover removed).

CHAPTER 3
TROUBLESHOOTING

Section I. ORGANIZATION OF TROUBLESHOOTING PROCEDURES

13. General Instructions

Troubleshooting of this equipment is based on the operational check contained in the quarterly preventive maintenance checks and services chart (para 8). When the trouble symptom is not known, perform all functions starting with item 17 in the quarterly maintenance service and inspection chart and proceed through the items until an abnormal condition or result is observed. When an abnormal condition or result is observed, note the paragraph reference and perform the checks and corrective actions indicated in the referenced troubleshooting chart or procedure. When the defect has not been sectionalized to an equipment group (receiving equipment, transmitting equipment, power, etc), refer to paragraphs 15 through 20. When the trouble symptom is known, or when the defect has been sectionalized to a specific unit, refer directly to the troubleshooting chart for that unit. If the corrective measures indicated do not restore normal performance, or if no corrective measures are listed, troubleshooting is required by higher category maintenance personnel.

14. Troubleshooting Techniques

a. General. Many troubles that develop in the AN/TRC-80 may be sectionalized without the use of external test equipment. Defective operation that is developing and that will eventually result in equipment failure can frequently be located by the senses of smell, touch, and hearing. By becoming thoroughly familiar with the equipment during periods of normal operation, the maintenance man can sense that something is wrong when he hears an unfamiliar sound, notices that an equipment case or cover is warmer (or colder) than usual, or becomes aware of an odor that is not normally present.

b. Built-In Test Equipment. In addition to indicator lights and fuse indicators on all units, the AN/TRC-80 contains front panel meters on the engine generator control panel, the three synthesizer units, the monitor panel, the receive and transmit converters, and the power amplifier. Some of the meters have associated switches that permit operational checks of various circuits within a chassis. Become familiar with the meter readings during normal operation; maximum use of these meters will permit the organizational repairman to localize most troubles without using external test equipment.

c. Abnormal Sounds. During normal operation of the AN/TRC-80, the sounds of the engine generator and engine cooling blower, the flushing blower, the klystron cooling blower, the teletypewriter motor, and the two or three (as equipped) rack blowers will blend to result in a characteristic background *noise* level. Erratic operation of any of these units will often result in a distinguishable change in the overall sound.

Section II. SECTIONALIZATION OF TROUBLES

15. General

Trouble in the AN/TRC-80 equipment will generally be the result of a defect in one of the following equipment groups: the primary power, the frequency generating and transmission equipment, the receiving equipment, or the antenna system. The following paragraphs in this section cover the procedures that should be followed to sectionalize defects to a unit within an equipment group. If the symptoms listed below describe the difficulties being

encountered, perform the recommended corrective measures.

16. Primary Power Trouble Sectionalization Chart

The chart below lists the symptoms peculiar to the engine generator and the associated control panel and circuit breaker panel. For defects within the individual dc power supplies, refer to the troubleshooting charts in the localizing procedures.

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
1	Entire radio set is dead, engine generator running.	*a.* Switches incorrectly set on engine generator control panel.	*a.* See that LOAD CONTROL switch is set to ON. Refer to engine generator troubleshooting charts (para 23).
		b. MAIN BREAKER on circuit breaker panel is tripped to OFF.	*b.* Reset MAIN BREAKER. If MAIN BREAKER trips again, VOLTAGE CONTROL switch on engine-generator control panel may be incorrectly set, causing excessive load current. Refer to engine-generator control panel troubleshooting chart (para 23*b*).
2	Engine generator running, only certain equipment areas appear to have primary power.	Circuit breakers on switch panel turned off, or blown fuse in one of the racks.	See that circuit breakers on switch panel are on. Refer to para 24.
3	Engine generator runs intermittently or will not run.	Defect in engine generator -------	Refer to instruction manual on engine generator.

17. Transmission Trouble Sectionalization Chart

When the radio set receives but does not transmit voice or teletypewriter signals, trouble exists within one of the major components that comprise the transmitting equipment (transmit synthesizer, modulator-multiplier, transmit converter, and power amplifier). Normal transmit operation is indicated by intolerance readings on the power amplifier POWER IN meter, the POWER OUT meter, and the monitor meter (with S2 in the A (voice deviation) position). The chart below sectionalizes trouble to one of the major components within the transmitting equipment. When diversity operation is used (TM 11-5820-469-10), two radio sets are used at the primary terminal, one designated *control* and the other designated *slave*. Satisfactory operation is possible with one transmitter inoperative; however, failure of the second transmitter will disrupt communication.

Item No.	Sectionalization procedure	Normal indication	Corrective measure or reference
1	On power amplifier POWER OUT meter, check INCIDENT KW scale and REFLECTED KW scale.	INCIDENT KW scale indication is not less than .85 KW; REFLECTED KW scale not less than .08 KW.	Check POWER IN meter indication. If POWER IN meter indication is normal, defect is in power amplifier; refer to paragraph 29. If power indication is not normal, check cable connection from transmit converter. Proceed to item 2.
2	On transmit converter (fig. 9 or 9.1), set meter function selector switch to OUTPUT.	Meter indication of 50 ----------	If no meter indication, or low indication is obtained, refer to paragraph 28 or 28.1.
3	On the synthesizer (center unit of rack A3), check meter readings with selector switch at MIXER 2 AGC and MIXER 2 OUT, AN/TRC-80 only.	Meter indications of 30 for both meter switch positions.	Refer to synthesizer troubleshooting chart (para 27).

Item No.	Sectionalization procedure	Normal indication	Corrective measure or reference
3.1	On the transmit 0-1462A/TRC synthesizer (middle-mounted synthesizer) of rack A3, check the OUT OF LOCK indicator and TUNING VOLTAGE meter.	OUT OF LOCK indicator should be off, and TUNING VOLTAGE meter should indicate an approximate midscale reading (50).	Refer to paragraph 27.1.
4	On monitor, set switch S2 to position A and press TEST SIGNAL pushbutton on control panel.	Voice deviation indication on meter at SET POINT (red marker line) on meter.	Refer to items 2, 4, and 7 of paragraph 20.

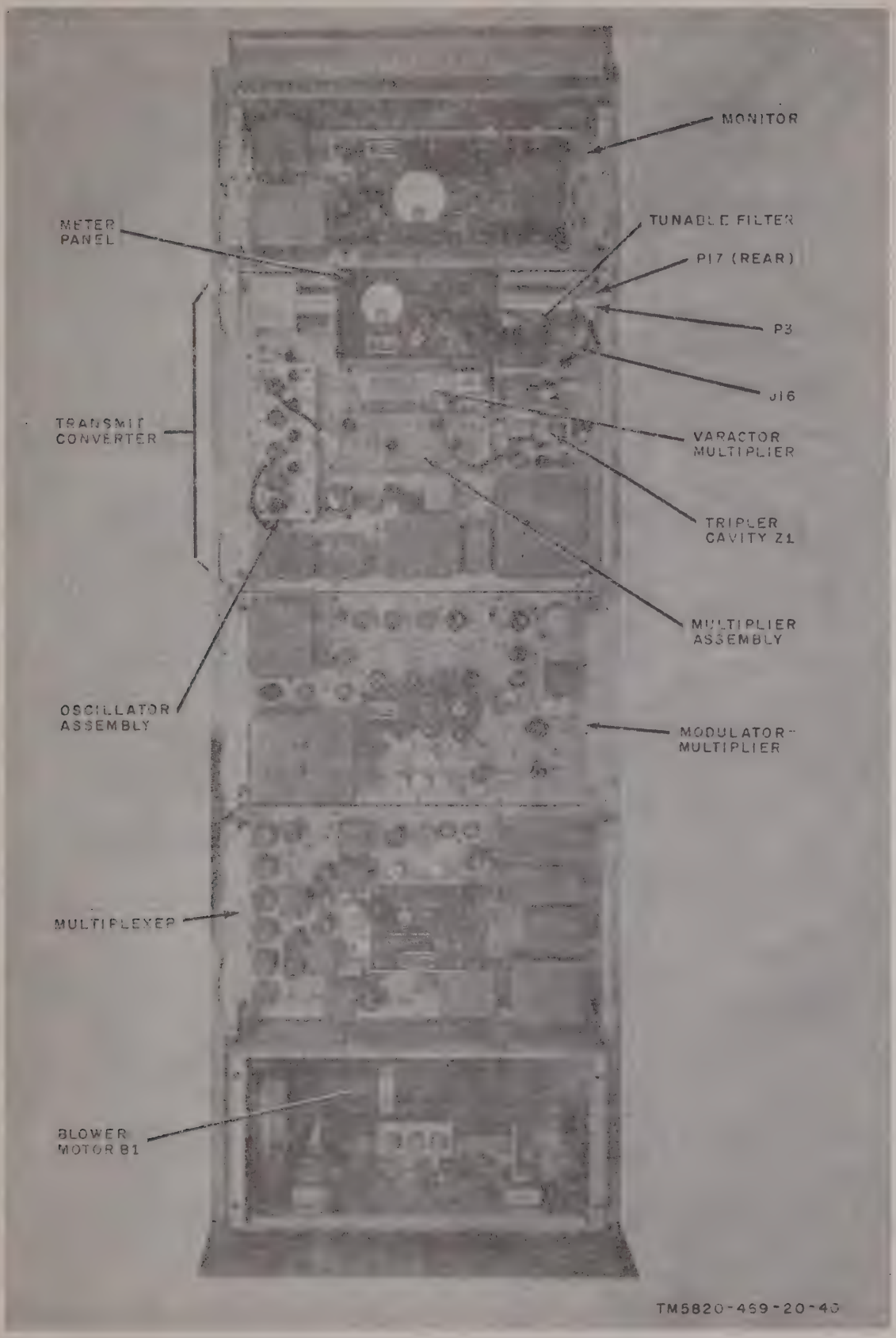

Figure 9. Rack 1 equipment with covers removed, AN/TRC-80.

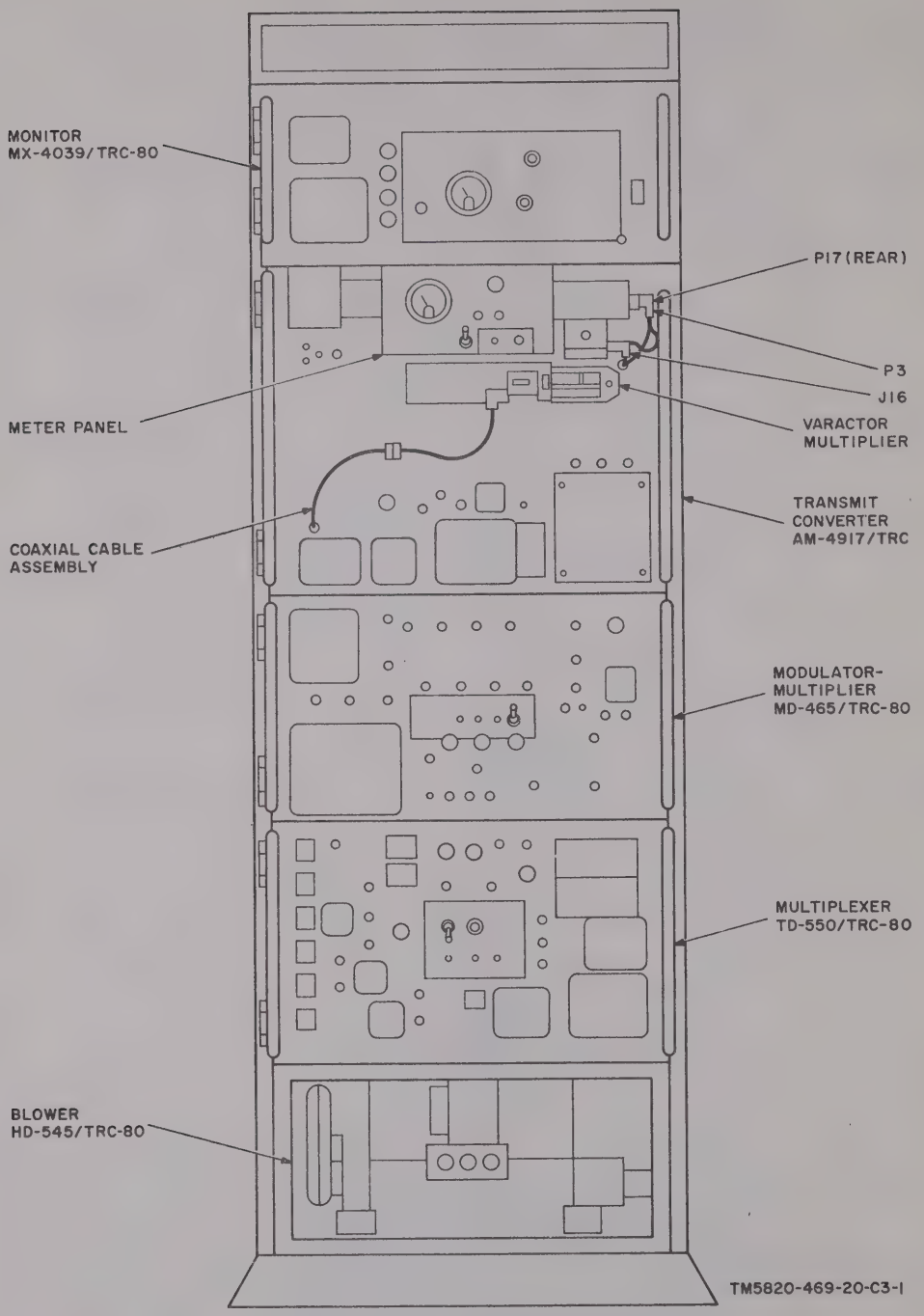

Figure 9-1. Rack A1 equipment with covers removed, AN/TRC-80A.

18. Receiver Trouble Sectionalization Chart (Diversity Operating, Battery Terminal)

When diversity operation is used, the two receivers (fig. 10, 10.1, 11 and 11.1) at the battery terminal are used and are tuned to different frequencies. In the event of one receiver failure, satisfactory operation is possible with only one receiver. To sectionalize the defective unit (receiver) converter, receive synthesizer, and if. amplifier) within the receiver, perform the procedures listed in the chart below:

Item No.	Sectionalization procedure	Normal indication	Corrective measure or reference
1	On switch panel, disconnect coaxial patch cable from IF IN jack. On if. amplifier, set switch S1 on 8-mc if. No. 2 subchassis to RCVR GAIN 6.	Meter M1 on the 8-mc if. No. 2 subchassis indicates 6.	Proceed to item 2.
2	On receive converter, set METER FUNCTION SELECTOR switch to RECEIVE SIG DET.	Meter on receive converter panel indicates at SET POINT mark.	Proceed to item 3.
3	Perform the following on both receive synthesizer units: Check meter readings with meter selector switch at MIXER 2 AGC and MIXER 2 OUT positions, AN/TRC-80 only.	Meter indications of 30 for both meter switch positions.	If meter indication 30 is obtained, proceed to item 4; if no meter indication is obtained, refer to synthesizer troubleshooting chart (para 27).
3.1	On the receive 0-1462A/TRC synthesizers (top and bottom) of rack A3, check the OUT OF LOCK indicator and the TUNING VOLTAGE meter, AN/TRC-80A only.	OUT OF LOCK indicator should be off, and TUNING VOLTAGE meter indicator should be approximately midscale.	If no indication is obtained the 0-1462A/TRC is probably defective. If the indications in this procedure are normal, but no indication was obtained in item 1 (above), perform procedure in item 4 below.
4	Press TUNE-UP SIGNAL switch on receive converter meter panel, and repeat sectionalization procedures given in items 1 and 2 above.	Meter M1 on 8-mc if. No. 2 subchassis indicates 6. Meter on receive converter panel indicates at SET POINT mark.	If both meter indications are normal, distant transmitter is defective. If no reading is obtained on M1, if. amplifier or associated if. power supply is defective. Refer to paragraphs 31 and 32. If both meter indications are abnormal, refer to paragraph 30 or 30.1.

19. Receiver Trouble Sectionalization Chart (Diversity Operation, Battalion Terminal)

At the battalion terminal where two complete radio sets are used, one radio set is designated as the control and the other is designated as the slave (TM 11-5820-469-10). To sectionalize defects in the receiver used in the control radio set, perform the procedures given in items 1, 2, and 3 or 3.1 of the chart in paragraph 18. Perform item 4 only if items 1, 2, and 3 or 3.1 indicate the need. In item 3 or 3.1, be sure to check the synthesizer that is being used with the receive converter in the control set. To sectionalize defects in the receiver used in the slave radio set, perform the following procedure:

Item No.	Sectionalization procedure	Normal indication	Corrective measure or reference
1	On if. amplifier associated with slave receive converter, set switch S1 on 8-mc if. No. 2 subchassis to RCVR GAIN 6 position.	Meter M1 on 8-mc if. No. 2 indicates reading of 6.	Proceed to item 2.
2	On receive synthesizer in use at slave radio set, check meter readings with meter selector switch in MIXER 2 AGC and MIXER 2 OUT positions, AN/TRC-80 only.	Meter indication of 30 obtained for both meter switch positions.	If no reading is obtained, synthesizer is defective. If indication in this step is normal, but no indication was obtained in item 1 (above), perform procedures in items 3 through 5 below.
2.1	On the receive 0-1462A/TRC synthesizers (top and bottom) of rack A3, check the OUT OF LOCK indicator and the TUNING VOLTAGE meter, AN/TRC-80A only.	OUT OF LOCK indicator should be off, and TUNING VOLTAGE meter indicator should be approximately midscale.	If no indication is obtained the 0-1462A/TRC synthesizer is probably defective. If the indications in this procedure are normal but no indication was obtained in item 1 (above), perform procedures in items 3 through 5 below.
3	At switch panel, disconnect REMOTE end of OUT NO. 2 coaxial patch cable (or OUT NO. 1, depending on which receiver converter is being used) and connect it to associated IF IN jack.	None.	None.
4	On receive converter in use, press TUNE-UP SIGNAL switch and repeat sectionalization procedures given in items 1 and 2 above.	Meter M1 on 8-mc if. No. 2 subchassis indicates reading of 6. Meter on receive converter panel indicates at SET POINT mark.	If both meter indications are normal, distant transmitter is defective. If no reading is obtained in M1, if. amplifier or associated power supply is defective. Refer to paragraphs 31 and 32. If both indications are abnormal, refer to paragraph 30 or 30.1.
5	On the switch panel, reconnect the coaxial patch cable to the REMOTE jack.	None.	None.

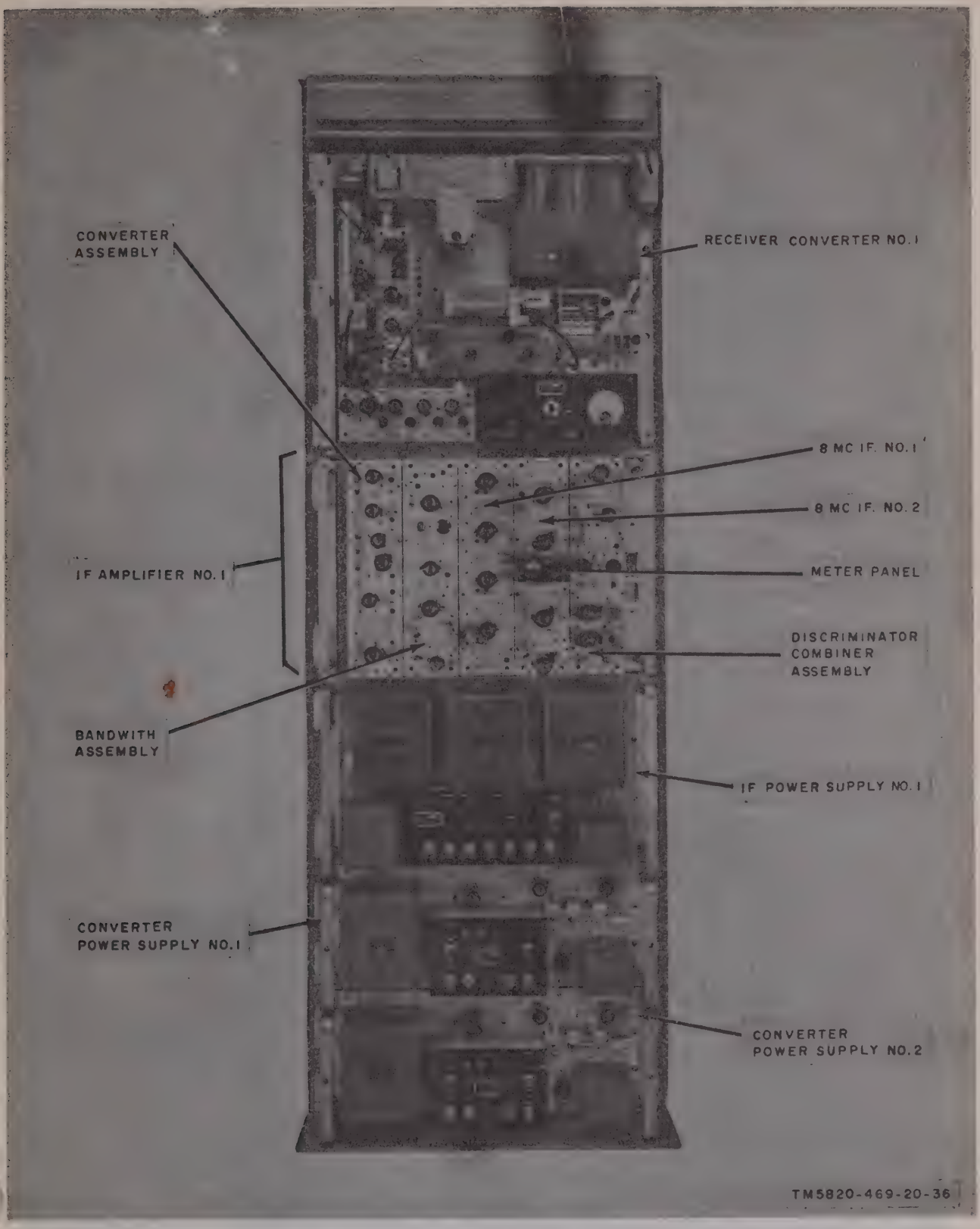

Figure 10. Rack 5, receiving equipment with covers removed.

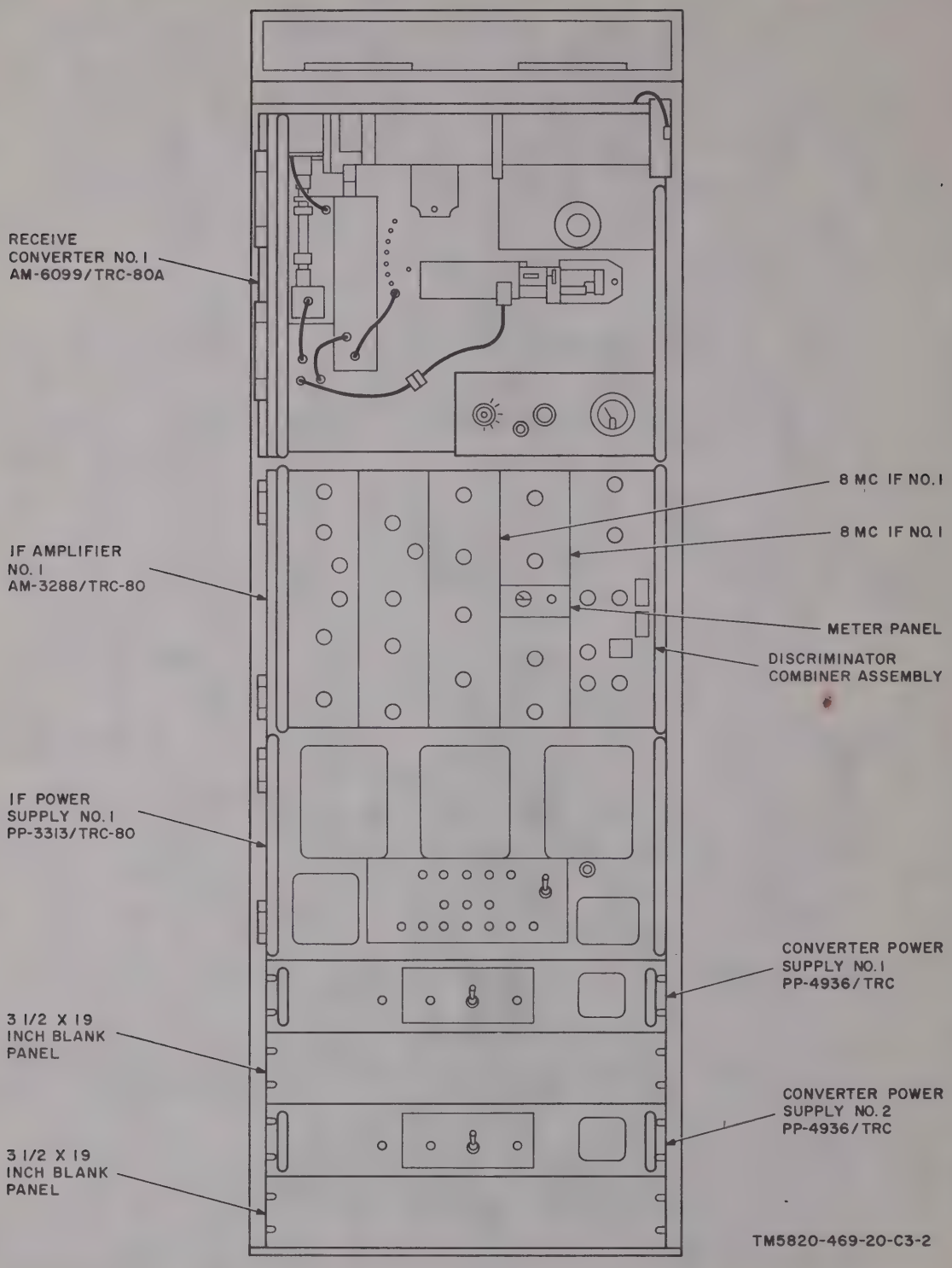

Figure 10.1. *Rack A5, receiving equipment with covers removed AN/TRC-80A.*

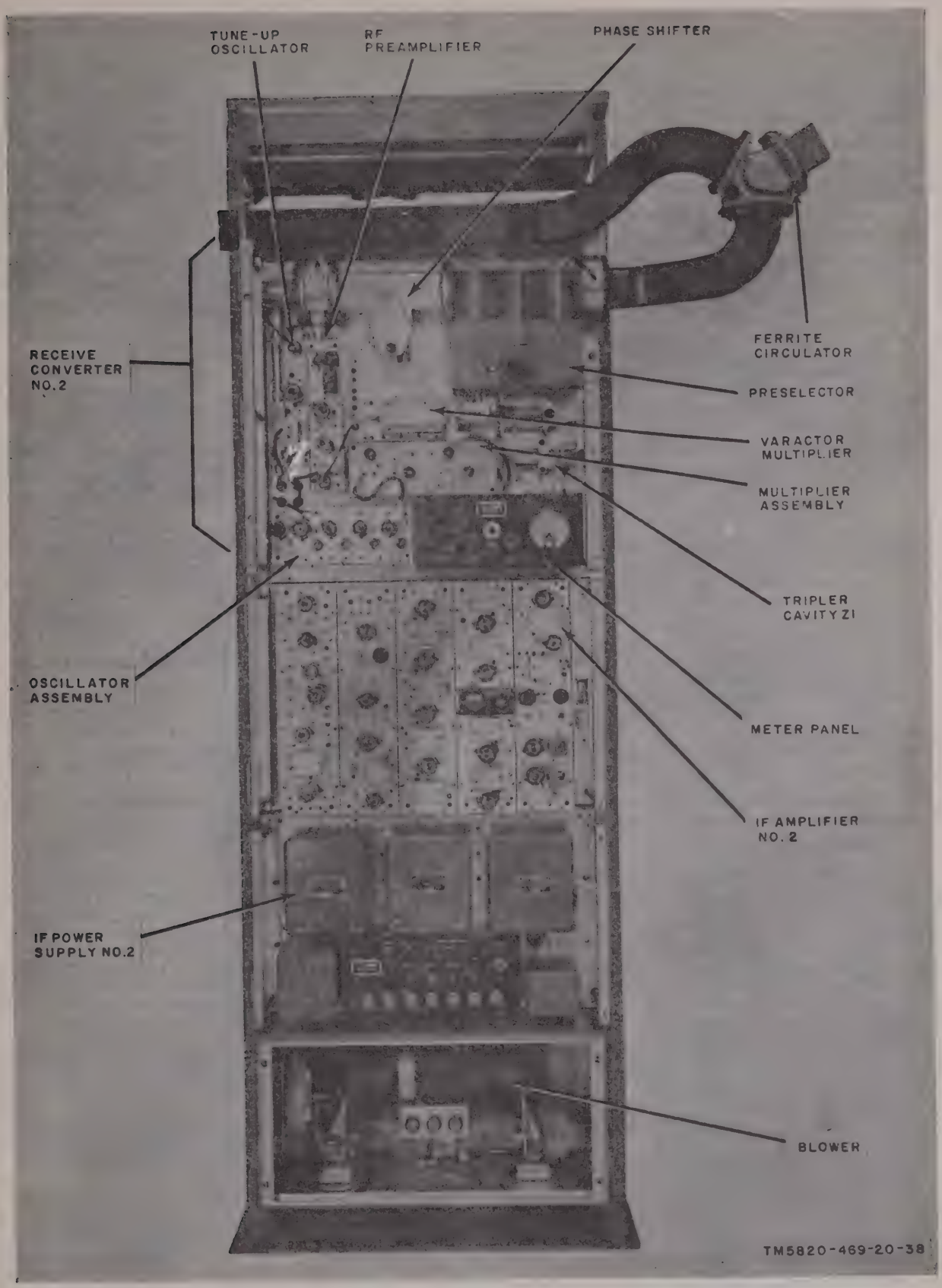

Figure 11. *Rack* 4, *receiving equipment with covers removed.*

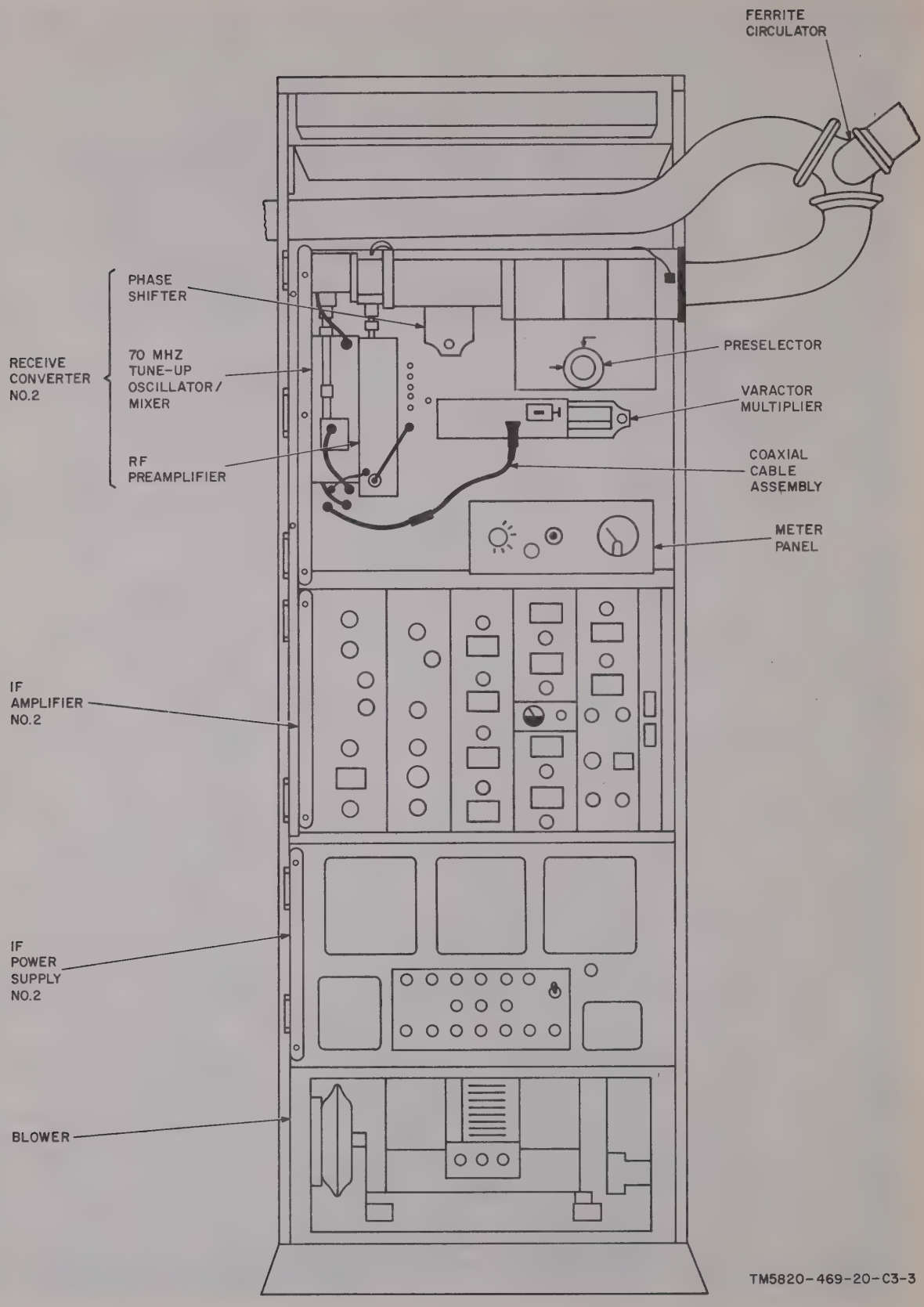

Figure 11.1. *Rack A4, receiving equipment with covers removed AN/TRC-80A.*

20. Sectionalizing Troubles with Monitor

It is often possible to sectionalize voice and teletypewriter signal troubles in the AN/TRC-80 to the telegraph terminal, the multiplexer, the modulator-multiplier, or the if. amplifier in the receiver by using the monitor in rack A1. The following chart lists the steps to be taken in the sectionalizing of troubles by use of the monitor meter and a test signal from the control panel. For certain tests, the distant station is requested to send a test signal. If at any time during the tests no meter indication is obtained, check the associated interconnecting cabling (para 34 through 39) before taking any further corrective action. The *Corrective measures* column in the chart below lists minor adjustments that may be performed by the organizational repairman; however, the repairman should note any recurrent deviations from normal operating conditions and refer to higher category maintenance personnel as required.

Note: Switch S1 of the monitor must remain in position A at all times. No teletypewriter or voice signals are to be applied except as specified. INJ. switch S2 in steps 5 and 6 apply to Power Supply PP-3314/TRC-80 used in AN/TRC-80 only. Power Supply PP-4936/TRC used in AN/TRC-80A does not contain this switch.

Step	Action	Purpose of test	Normal indication	Corrective measures
1	Set monitor switch S2 to B and press control panel TEST SIGNAL pushbutton.	Adjust test signal level.	SET POINT indication on monitor meter.	Adjust TEST SIGNAL LEVEL control on control panel for SET POINT indication on monitor meter.
2	Set monitor switch S2 to C and press control panel TEST SIGNAL pushbutton.	Check multiplexer voice transmit channel.	SET POINT indication on monitor meter.	Adjust R29 (on multiplexer fig. 12) for SET POINT indication on monitor. Check V1 and V6 in multiplexer and power supply tubes V10, V11, and V12 (fig. 12).
3	Set monitor switch S2 to F and set telegraph terminal switches to SEND and 4W.	Check signal level from telegraph terminal.	Monitor meter indication exceeds SET POINT.	Check telegraph terminal (TM-11-5805-246-10 and -20, or TM 11-5805-356-12).
4	Set monitor switch S2 to G and set telegraph terminal switches to SEND and 4W.	Check multiplexer teletypewriter transmit channel.	SET POINT indication on monitor meter.	Adjust R5 (fig. 12) for SET POINT indication on monitor meter. Check multiplexer tube V2.
5	Set monitor switch to S2 to D and INJ switch of converter power supply No. 2 to OFF. Ask distant terminal to transmit test signal.	Check output level of if. amplifier No. 1.	SET POINT indication on monitor meter.	Adjust OUTPUT LEVEL R31 (fig. 21) on discriminator combiner module of if. amplifier No. 1 for SET POINT indication on monitor meter.
6	Set monitor switch S2 to D and INJ switch of converter power supply No. 1 to OFF. Ask distant terminal to transmit test signal.	Check output level of if. amplifier No. 2.	SET POINT indication on monitor meter.	Adjust OUTPUT LEVEL R31 (fig. 21) on discriminator combiner module of if. amplifier No. 2 for SET POINT indication on monitor meter.
7	Set monitor switch S2 to E. Ask distant terminal to transmit test signal.	Check multiplexer voice receive channel.	SET POINT indication on monitor meter.	Adjust R42 (fig. 12) on multiplexer for SET POINT indication on monitor meter. Check multiplexer tubes V5 and V8.
8	Set monitor switch S2 to H. Ask distant terminal to transmit teletypewriter mark tone.	Check multiplexer teletypewriter receive channel.	SET POINT indication on monitor meter.	Adjust R41 (fig. 12) on multiplexer for SET POINT indication on monitor meter. Check multiplexer tubes V4 and V3.
9	Set monitor switch S2 to A, press control panel TEST SIGNAL pushbutton.	Check frequency deviation at output of modulator-multiplier.	SET POINT indication on monitor meter.	Adjust OW DEV R17 (fig. 14) on modulator-multiplier for SET POINT indication on monitor meter. Refer to modulator-multiplier troubleshooting chart (para 26).

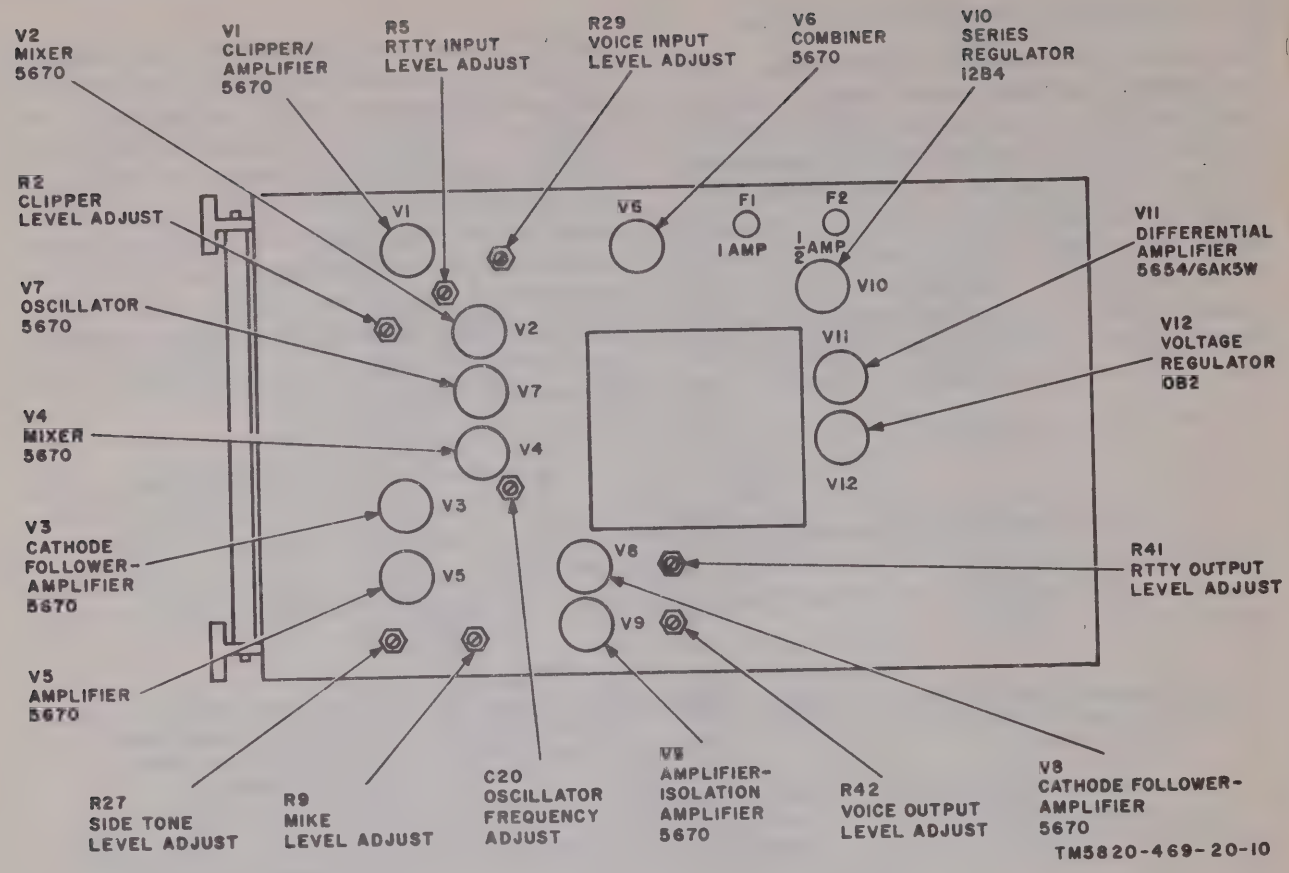

Figure 12. Multiplexer, tube location and adjustment points.

Section III. LOCALIZATION OF TROUBLES

21. General

The procedures in this section localize troubles with the units of the equipment groups (para 15) of the AN/TRC-80. Most of the troubleshooting charts are based on abnormal front panel indications and abnormal meter readings. Troubleshooting of the multiplexer unit is performed as part of the sectionalization check by use of the monitor in rack A1 (para 20) and the operational trouble symptoms (para 22). References from the quarterly maintenance service and inspection chart (para 8) are made direct to the troubleshooting chart that pertains to the equipment unit being checked. When the corrective measures do not restore normal operation, or if no corrective measures are listed, repair by higher category of maintenance is required.

Note: The fuse and pilot lamp locations are illustrated in TM 11-5820-469-10.

22. Voice and Teletypewriter Channels Troubleshooting Chart

This troubleshooting chart localizes troubles to defective tubes and parts within the multiplexer unit and to units associated with the multiplexer.

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
1	Cannot receive teletypewriter signals. Transmission of teletype-	Defective V3 or V4 in multiplexer. Defective teletype-	On monitor, set S2 to D. If monitor meter indication is 0, no teletype-

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
	writer and voice normal. Reception of voice normal.	writer equipment in distant station, or defective teletypewriter equipment in local station.	writer signal is being received; instruct distant station to check its teletypewriter transmit equipment. If meter indication on D is normal, set S2 to H. If indication is normal, check local teletypewriter equipment. If indication is 0, defect is in multiplexer unit. Check tubes V3 and V4.
2	Cannot transmit teletypewriter signals. Reception of teletypewriter and voice signals normal. Transmission of voice normal.	Defective V2 or V6 in multiplexer. Defective local teletypewriter equipment. Defective cabling to multiplexer. Defective teletypewriter equipment at distant station.	On monitor, set S2 to F. If indication is 0, check control panel and teletypewriter equipment cabling (para 34). If meter indication is normal, set S2 to G. If meter indication is 0, check V2 and V6 in multiplexer. If indication is normal, have distant station check its teletypewriter receiving equipment.
3	Cannot receive voice signals at local headset or speaker. Other facilities normal.	Defective V5 or V8 in multiplexer, or defective cabling to control panel.	On monitor, set S2 to E. If indication is 0, check V5 and V8 in multiplexer unit. If indication is normal, check cabling connections.
4	Cannot transmit voice from control panel or local microphone. Other facilities normal.	Defective V1 in multiplexer. Defective cable connection between control panel and multiplexer.	Set monitor switch S2 to B. If indication is normal, replace V1. If indication is 0, check cabling to control panel (para 34).
5	Cannot receive or transmit teletypewriter signals. Other facilities normal.	Defective V3 or V7 in multiplexer unit.	Check V3 and V7.
6	Cannot transmit from local microphone. No local sidetone. Other facilities normal.	Defective microphone or defective V9 in multiplexer unit.	Check microphone by substitution. Replace V9.
7	Cannot transmit or receive voice or teletypewriter signals.	Defect in multiplexer ac input circuit or dc power supply.	If FILAMENT indicator lamp is out, check fuse F1. If FILAMENT indicator lamp is lighted but TIME DELAY and B+ indicator lamps do not light, check fuse F2 and tubes V10, V11, and V12 in multiplexer.
8	Low audio level for sidetone on local headset.	Level adjust sidetone R27 turned down too low. Defective V9.	Adjust R27 (fig. 12) for comfortable audio level. Check tube V9.

23. Primary Power Troubleshooting Chart

This troubleshooting chart localizes defects to improperly set controls on the engine-generator control panel, the engine control starting panel, and to minor defects in the engine generator. Defects pertaining to the engine generator and the associated starting panel are covered in *a* below. Troubles in the engine-generator control panel are localized in the procedures in *b* below. Repairs on the engine generator are performed by higher category maintenance personnel.

a. Engine Generator and Engine Control Starting Panel Troubleshooting Chart (fig. 11 and 36, TM 11-5820-469-10).

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
1	Engine generator does not start when ENGINE CONTROL start switch is held at START.	*a.* EMERGENCY ENGINE SHUTDOWN switch on engine generator control panel is set at STOP.	*a.* Set EMERGENCY ENGINE SHUTDOWN switch to RUN.
		b. Defective battery -------	*b.* Higher category maintenance required.

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
2	OIL PRESSURE indicator on engine control starting panel lights.	Low oil pressure----------	Turn ENGINE CONTROL switch to OFF. Check for oil leaks and for proper oil level. If oil level is normal, higher category maintenance is required. *Caution:* Turn off the engine generator immediately when OIL PRESSURE on engine control starting panel lights.

b. Engine-Generator Control Panel Troubleshooting Chart.

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
1	Ammeter indicates battery is discharging.	Defective battery to engine-generator connection.	Check connection.
2	Hourmeter on engine generator control panel not running.	Defect in clock mechanism or internal connection.	Higher category maintenance required.
3	Voltmeter indicates above or below 208-volt setting.	VOLTAGE CONTROL rheostat incorrectly set.	Adjust VOLTAGE CONTROL rheostat for 208-volt voltmeter indication.
4	Frequency meter indicates above or below 400 cycles-per-second setting.	FREQUENCY CONTROL switch incorrectly set.	Operate FREQUENCY CONTROL switch to RAISE or LOWER position until frequency meter indicates 400 cps. *Caution:* If frequent corrections are necessary, higher category maintenance is required.
5	HEAD TEMPERATURE indicator lights.	Engine generator cooling system defective.	Higher category maintenance required.

24. Power Distribution Panel SB-1565/ TRC-80 Troubleshooting Chart

Most of the trouble symptoms (blown-fuse indicators and pilot lamps) on this switch panel indicate that trouble exists in other units of the AN/TRC-80. For example, when one of the AIR FAILURES indicators lights, defective blower operation has occurred in one of the equipment racks. Similarly, when the FLUSHING BLOWER fuse opens and fuse replacement does not correct the trouble, the defect will generally be located in the flushing blower circuit and not within the switch panel.

Note: Item No. 6 applies to AN/TRC-80 only. Blower unit in rack A3 is deleted in AN/TRC-80A.

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
1	Hut lights are on, but HUT LIGHTS indicator lamp is out.	Defective pilot lamp ------	Replace pilot lamp (TM 11-5820-469-10).
2	One of FUSES indicators lights----	Open fuse ----------	Replace defective fuse (TM 11-5820-469-10).
3	FLUSHING BLOWER indicator lamp goes out.	Open FLUSHING BLOWER fuse, FLUSHING BLOWER circuit breaker on circuit breaker panel tripped, defective pilot lamp, or trouble in flushing blower circuit.	Check FLUSHING BLOWER FUSE and indicator lamp. Reset FLUSHING BLOWER circuit breaker. Higher category maintenance required if circuit breaker trips again.
4	RACK BLOWERS indicator lamp goes out but AIR FAILURES indicator lamps are not lighted.	Defective pilot lamp ------	Replace pilot lamp.
5	AIR FAILURES RACK 1 indicator lamp lights.	Open fuse in rack A1 blower circuit.	Check F1 and F2 in rack A1.
6	AIR FAILURES RACK 3 indicator lamp lights.	Open fuse in rack A3 blower circuit.	Check F1 and F2 in rack A3.

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
7	AIR FAILURES RACK 4 & 5 indicator lamp lights.	Open fuse in rack A4 blower circuit.	Check F1 and F2 in rack A4.
8	RACK power indicator lamp goes out.	Defective pilot lamp. RACK POWER circuit breaker on circuit panel tripped off.	Replace pilot lamp. Check RACK POWER circuit breaker on circuit breaker panel. If circuit breaker trips after resetting, higher category maintenance is required.

25. Monitor Troubleshooting Chart (fig. 13)

The monitor is used to visually check incoming and outgoing voice and teletypewriter signals. When the overall equipment appears to be working normally but indications on the monitor are abnormal, a defect may exist within the monitor. The chart below lists the trouble symptoms and the recommended corrective measures for a defective monitor. To gain access to the pluckout components within the monitor, refer to paragraph 40.

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
1	Power indicator does not light when PWR switch is set to ON.	*a.* Defective fuse F1 ------ *b.* No connection to 120-volt ac line at TB1 (rear of monitor chassis).	*a.* Replace F1. *b.* Check connections to terminals 1 and 2 of TB1 (fig. 22).
2	Pilot lamp is on, but no meter indications on any switch position.	Defect in monitor dc power supply.	Check V7, V8, and V9 (fig. 13).
3	Normal meter indications on all switch positions except A of S2.	*a.* No connection, or poor connection, to J8 on rear panel of monitor. *b.* Defective V1, V2, V3, or V4.	*a.* Check connection to J8 (fig. 22). *b.* Check V1, V2, V3, and V4 (fig. 13).
4	No reading, or inconsistent meter readings, on all positions of S2.	Defect in V5, V6, or V7 ---	Check V5, V6, and V7 (fig. 13).
5	No meter indication on just one position of S2 (rest of AN/TRC-80 equipment operating normally).	Open coaxial connection to one of rear panel jacks.	Check connections to jacks J1 through J8 (fig. 22 and para 35*b*).

26. Modulator-Multiplier Troubleshooting Chart (fig. 14)

When the multiplexer unit is functioning normally, but no input signal (70-megacycle (mc) modulated output from modulator-multiplier) is being applied to the transmit converter, the trouble is probably located in the modulator-multiplier. The chart below lists the trouble symptoms and recommended corrective measures for a defective modulator-multiplier.

Item No.	Trouble symptom	Probable trouble	Checks and correction measures
1	FIL indicator does not light when POWER switch is turned on.	Open F1 (fig. 20, TM 11-5820-469-10). Defective connection to TB1.	Replace F1. Turn off power and check connections to TB1 (fig. 24).
2	FIL indicator is lighted but TIME DELAY and B+ indicators are not lighted.	Blown fuse in dc power supply ----	Check B+ fuse F2. Check PWR SUPPLY fuse F3.
3	Only order-wire transmission possible.	Defective V17 or V18. Poor connection to J8.	Check V17 or V18. Check connection on rear panel to J8 (fig. 24).

Item No.	Trouble symptom	Probable trouble	Checks and correction measures
4	No order-wire transmission possible. Other transmission facilities normal.	Defective connection to OW INPUT connector J8.	Check connection to J8 (fig. 24).
5	No transmission possible; multiplex unit (para 20 and 22) checks normal.	*a.* Defective tube in modulator-multiplier. *b.* Defect in transistorized power supply.	*a.* Check V1 through V16. *b.* Higher category repair required.

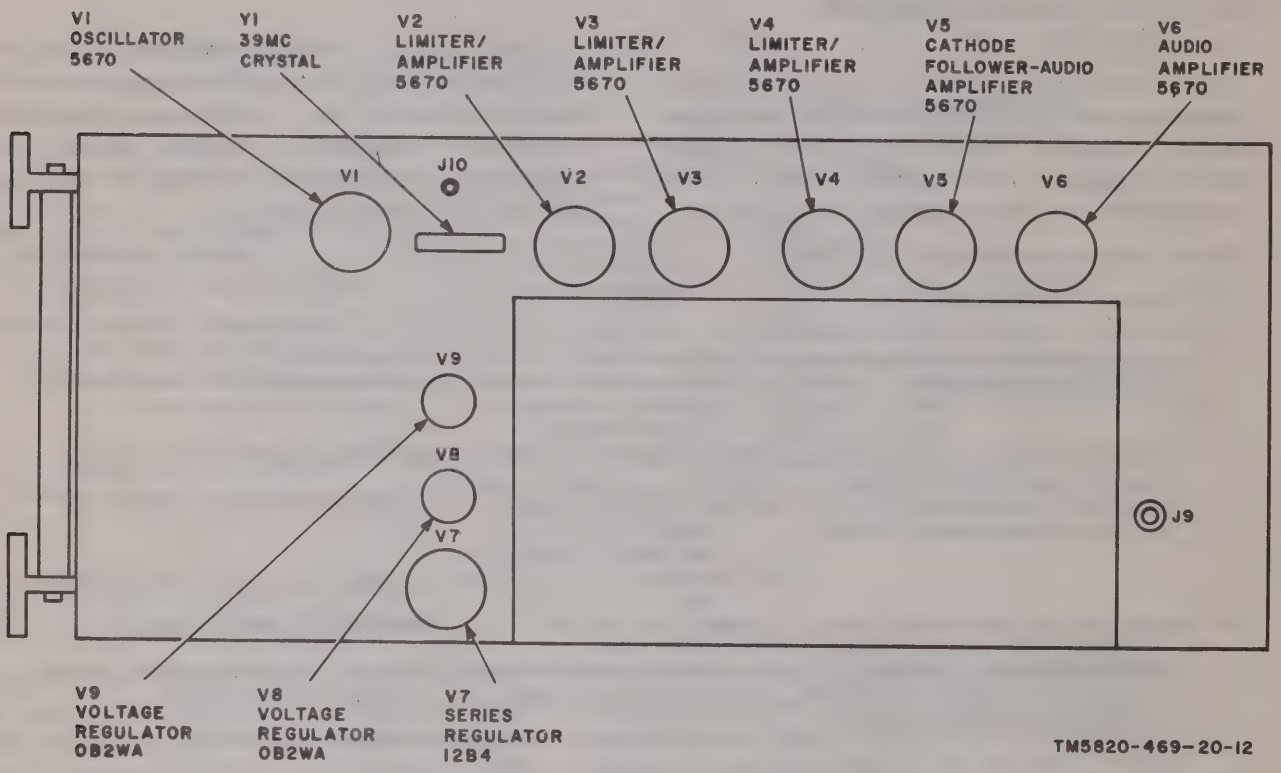

Figure 13. Monitor, tube and crystal location diagram.

27. Synthesizer Troubleshooting Chart, AN/TRC-80 Only

Three synthesizer units are used in the AN/TRC-80 equipment. When the INT-EXT switch on the oscillator section of the transmit converter is set to EXT *(normal operating condition)*, a 30- to 34-mc signal is supplied by synthesizer No. 2 (fig. 6, TM 11-5820-469-10) to V2, in the oscillator assembly of the transmit converter. Similarly, when the INT-EXT switch on the oscillator assembly of the receive converter is set to EXT *(normal operating condition)*, a 30- to 34-mc signal from synthesizer No. 1 is applied to V2 in the oscillator assembly of the receive converter. Synthesizer No. 3 is used in diversity operation for the second receiver. When all other indications appear normal but no output is obtained from either the transmit converter or the receive converter, check the synthesizer unit that supplies the conversion frequency to the converter being checked. The troubleshooting chart lists the trouble symptoms that apply to all three synthesizers.

Item No.	Sectionalization procedure	Normal indication	Corrective measure or reference
1	FIL indicator lamp does not light when PWR switch is set to ON.	*a.* Defective pilot lamp or fuse.	*a.* Check FIL fuse F602. Check FIL panel lamp.
		b. No connection, or defective power input connection.	*b.* Check connections on terminals 1 through 4 of TB 601 (rear panel of synthesizer, fig. 27).
2	OSCILLATOR NO. 2 and NO. 3 OVEN indicators not cycling correctly. (15 seconds on, 2-3 minutes off is normal.)	*a.* Defective pilot lamp or fuse.	*a.* Check F401 or F751. Check OVEN indicator lamps.
		b. Defect in oven circuit ..	*b.* Higher category maintenance required.
3	Panel meter indicates less than 30 when meter selector switch is set to OSC 3 AGC.	*a.* Defective tube in oscillator No. 3.	*a.* Check V750 and V751.
		b. No B+ applied to oscillator No. 3.	*b.* Replace F603. If fuse blows higher category maintenance is required.
4	Panel meter indicates less than 30 when meter selector switch is set to OSC 3 OUT.	Same as item 3 above	Same as item 3 above.
5	Panel meter indicates less than 30 when the meter selector switch is in OSC 2 AGC or OUT positions.	Defective tubes	Check V401 and V402.
6	Panel meter indicates less than 30 in OSC 1 AGC.	Defective tube	Check V301.
7	Panel meter indicates less than 30 when meter selector switch is set to MIXER 1 AGC or OUT.	Defective tube	Check V101, V102, and V103.
8	Panel meter indicates less than 30 when meter selector switch is set to MIXER 2 AGC or OUT.	Defective tube	Check V201, V202, and V203.

27.1. Synthesizer Troubleshooting Chart, AN/TRC-80A Only

Three Electrical Frequency Synthesizers 0-1462A/TRC are used in the AN/TRC-80A equipment (three 0-937/TRC-80's are in AN/TRC-80). The 1,082.5- to 1,232.4875-MHz signal, however, is applied to the varactor multiplier units of the transmit and receive converters. When all other indications appear normal but no output is obtained from the transmit converter or the receive converter, check the 0-1462A/TRC synthesizer that supplies the conversion frequency to the converter being checked. The troubleshooting chart applies to all 0-1462A/TRC synthesizers.

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
1	POWER indicator lamp does not light when POWER is set to ON.	*a.* Defective pilot lamp or fuse.	*a.* Check fuse F1 on power panel. Check POWER indicator lamp on fault panel.
		b. Power supply has not recovered from overload cutoff.	*b.* Deenergize and reenergize POWER ON switch.
2	OUT OF LOCK indicator lamp flashing.	Incorrect output frequency.	Rotate MHZ frequency knob to appropriate frequency setting of MEGAHERTZ switches. Adjust until TUNING VOLTAGE indicator is at midscale.

28. Transmit Converter Troubleshooting Chart, AN/TRC-80 Only

(fig. 9, 16, and 17)

Two input signals are applied to the transmit converter. One signal is the 70-mc signal from V16 in the modulator-multiplier. The other signal is a 30- to 34-mc signal from the synthesizer unit; the INT-EXT switch on the transmit converter must be in the EXT position. The output signal of the transmit converter is a 4.4- to 5.0-kilomegacycle (kmc) signal that is applied to the klystron unit in the power amplifier. When both the modulator-multiplier and the synthesizer inputs are normal (para 26 and 27) but there is no indication on the POWER IN meter of the power amplifier, the trouble is in the transmit con-

verter or the cabling. The chart below lists the symptoms and the recommended corrective measures for a defective transmit converter. With the exception of the tubes in the multiplier assembly, the tube removal procedures are obvious. Refer to paragraph 50 for the multiplier assembly tube replacement procedures.

Note. When performing the procedures in items 4 through 11 below, set the transmit converter meter function selector switch to the switch position corresponding to the control being adjusted.

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
1	With POWER switch set to ON, FIL indicator fails to light.	Open F1, defective FIL indicator, no connection, or poor connection, to terminals 1 and 2 of TB1 (fig. 23).	Turn off power. Check F1 and FIL indicator lamp. Check connections to TB1 on rear panel of transmit converter.
2	After 30 seconds of operation, TIME DELAY light does not light.	Defective TIME DELAY indicator, defective time delay relay K3, no connection, or poor connection to terminals 3 and 4 TB1 (fig. 23)	Check TIME DELAY indicator lamp. Check K3 by replacement. Check connections to TB1.
3	TIME DELAY lamp is lighted, but B+ lamp is not.	Open F2 or defective transistorized power supply.	Replace F2. If replacement F2 does not restore normal operation, higher category maintenance is required.
4	No peak indication on panel meter when C2 REF-B oscillator assembly control is adjusted.	*a.* No input from synthesizer. *b.* Defective buffer amplifier V2 in oscillator assembly.	*a.* Refer to paragraph 27. Check input cable connection (para 35*c*). *b.* Check V2.
5	No peak indication on panel meter when C3 REF-B oscillator assembly control is adjusted.	Defective frequency tripler V3 in oscillator assembly.	Check V3.
6	No peak indication on panel meter when C4 REF-B oscillator assembly control is adjusted.	Defective buffer amplifier V4 in oscillator assembly.	Check V4.
7	No peak indication on panel meter when C6 REF-C multiplier assembly control is adjusted.	Defective frequency doubler V1 in multiplier assembly.	Check V1 by replacement (para 50).
8	No peak indication on panel meter when C14 REF-D multiplier assembly control is adjusted.	Defective amplifier V2 in multiplier assembly.	Check V2 by replacement (para 50).
9	No peak indication on panel meter when C22 REF-E multiplier assembly control is adjusted.	Defective frequency doubler V3 in multiplier assembly.	Check V3 by replacement (para 50).
10	No peak indication on panel meter when tuning control F on multiplier assembly is adjusted.	Defective frequency tripler V4 in multiplier assembly.	Check V4 by replacement (para 50).
11	No peak indication on panel meter when tuning controls G and H on varactor multiplier are adjusted.	Defect in varactor multiplier stage.	Higher category maintenance required.
12	With meter function selector switch set to HELIX, meter indication is less than 80 when BEAM PUSH TO START pushbutton is pressed.	Defective BEAM indicator lamp. Defective regulator tube V1 or differential amplifier V2 on main chassis.	Replace BEAM indicator lamp. Check V1 and V2 on main chassis.
13	With meter function selector switch set to OUTPUT, meter indication is less than 40.	TUNABLE FIL control not adjusted correctly. Defective traveling wave tube V9.	Readjust TUNABLE FIL control (TM 11-5820-469-10). If adjustment does not restore meter reading to 40, higher category repair is required.
14	With meter function selector switch set to OUTPUT, there is a meter indication when CARRIER SWITCH on modulator-multiplier is pressed.	TUNABLE FIL control is set to carrier frequency.	Release CARRIER SWITCH and adjust TUNABLE FIL control for peak indication on slightly higher frequency.

28.1 Transmit Converter Troubleshooting Chart, AN/TRC-80A Only

(fig. 9.1 and 16.1)

Amplifier-Converter AM-4917/TRC (AN/TRC-80A transmit converter) accepts two input signals; one is a 70-mc signal from the fm modulator through filter FL2, and the other is a 4.4- to 5.0-ggc signal that is applied to the klystron unit of the power amplifier. When both the modulator and the 0-1462A/TRC synthesizer inputs are normal (para 26 and 27.1) but there is no indication on the POWER IN meter of the power amplifier, the trouble is in the AM-4917/TRC or the cabling. The chart below lists the symptoms and the recommended corrective measures for a defective AM-4917/TRC.

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
1	With POWER switch at ON, FIL indicator fails to light.	Open fuse F1, defective indicator, or poor connection to terminals 1 and 2 of TB1 (fig. 23).	Turn off power. Check F1 and FIL indicator lamp. Check connection on TB1 on rear panel of AN/TRC-80A transmit converter.
2	After 3 minutes of operation, TIME DELAY lamp does not light.	Defective TIME DELAY indicator, defective time delay relay K3, no connection or poor connection to terminals 3 and 4 of TB1.	Check TIME DELAY indicator lamp. Check K3 by replacement. Check connections on TB1.
3	With meter function switch in position G or H, no peak indication on the panel meter when POWER OUTPUT control on the 0-1462A/TRC synthesizer or controls G and H on the varactor multiplier are adjusted.	*a.* No input from 0-1462A/TRC synthesizer. *b.* Defective varactor multiplier.	*a.* Refer to paragraph 27.1. Check input cable connections (para 35*c*). *b.* Maintenance at a higher category is required.
4	With meter function selector switch set to HELIX and BEAM PUSH TO START button pressed, the meter should indicate less than 80 (normally 20 to 25). BEAM lamp should light. **Note.** Item 4 applies to AN/TRC-80A transmit converters equipped with HA-35N-type traveling wave tube only.	*a.* Defective regulator tube V1 or differential amplifier tube V2 on main chassis. *b.* Defective BEAM indicator lamp.	*a.* Check V1 and V2 on main chassis. *b.* Replace BEAM indicator lamp.
5	With meter function selector switch set to OUTPUT, meter indication is less than 40.	TUNABLE FIL control not adjusted correctly. Defective travelling wave tube V9.	Readjust TUNABLE FIL control (TM 11-5820-469-10). If adjustment does not restore meter reading to 40, higher category repair is required.
6	With meter function selector switch set to OUTPUT, there is a meter indication when CARRIER SWITCH on modulator-multiplier is pressed.	TUNABLE FIL control is set to carrier frequency.	Release CARRIER SWITCH, and adjust TUNABLE FIL control for peak indication on slightly higher frequency.

29. Power Amplifier Troubleshooting Chart

(fig. 18)

When the transmit converter is supplying a normal input driving signal (para 28 or 28.1) but meter indications on the pa are abnormal, the defect is probably in the pa stage or the associated power supply circuits. The power amplifier turning procedure is presented in TM 11-5820-469-10. When the trouble symptom is not known, perform each step in the tuning procedure until an indication of improper operation is observed. If the trouble symptom is known, refer directly to the appropriate trouble symptom (below) and perform the recommended checks and corrective measures.

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
1	FILAMENT switch is set to ON but klystron blower does not start.	Control panel drawer improperly seated. BLOWER circuit breaker not on.	Check control panel drawer for proper seating. Check BLOWER circuit breaker.
2	AIR and FILAMENT indicators not lighted.	Open F102, or klystron drawer improperly seated.	Check F102. Check klystron drawer for proper seating.
3	FILAMENT VOLTAGE meter does not indicate 6.5 volts.	FILAMENT ADJUST control improperly set.	Adjust FILAMENT ADJUST control for 6.5-volt meter indication. Higher category maintenance is required.
4	After 3 minutes of operation, TIME DELAY indicator does not light.	Defective relay amplifier tube.	Check tubes V101, V102, and V105 in control panel.
5	BEAM CURRENT meter indicates less than 450.	Klystron cavity controls improperly tuned.	Refer to tuning procedure (TM 11-5820-469-10), and retune klystron.
6	No reading on POWER IN meter when REFLECTED-INCIDENT switch is set to INCIDENT.	No input from transmit-converter.	Refer to paragraph 28 or 28.1.
7	With REFLECTED-INCIDENT switch at INCIDENT, POWER IN meter does not indicate 100 milliwatts.	DRIVE LEVEL control (on klystron panel) incorrectly set.	Adjust DRIVE LEVEL control for indication of 100 on POWER IN meter.
8	ALARM indicator lights and alarm buzzer sounds.	*a.* Drive signal from transmit converter low, or klystron cavities incorrectly tuned.	*a.* Check transmit converter (para 28 or 28.1). Check klystron cavity tuning (TM 11-5820-469-10) for less than .08 REFLECTED KW and more than .8 INCIDENT KW indications on POWER OUT meter.
		b. Transmitter antenna connection improperly made.	*b.* Turn off power amplifier. Check antenna connection at OUTPUT connector (fig. 31) and XMTR ANT CONNECT connector (fig. 12, TM 11-5820-469-10) on top of shelter roof.

30. Receive Converter and Converter Power Supply Troubleshooting Chart, AN/TRC-80 Only.

(fig. 19)

a. Receive Converter Troubleshooting Chart. The receive converter accepts two input signals; one is a 4.5- to 5-mc modulated signal from the distant AN/TRC-80, and the other is a 30- to 34-mc signal from the synthesizer used with the receive converter. The output of the receive converter is a 70-mc signal that is applied to the if. amplifier unit. To determine if the defect is in the receive converter or in another receiver unit, set the METER FUNCTION SELECTOR switch to the J-TUN. DET. position and press the TUNE-UP SIGNAL button. If an indication of 50 is obtained on the panel meter, the trouble is probably external to the receive converter. If no meter indication is obtained, check oscillator doubler V1 in the tuneup oscillator (fig. 19). If V1 checks good, retune the receive converter as directed in the tuning procedure (TM 11-5820-469-10) until an abnormal indication is obtained. Refer to the trouble symptom that corresponds to the abnormal indication and perform the recommended checks and corrective measures.

Note 1. When performing the procedures in items 3 through 10, set the METER FUNCTION SELECTOR switch to the switch position corresponding to the control being adjusted. For example, in item 3, when control C2 REF-B is adjusted, *the* METER FUNCTION SELECTOR *switch must be set to B.*

Note 2. Refer to paragraph 50 before attempting to replace tubes in the multiplier assembly.

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
1	Filaments not on, no meter indications.	Defective power input connection. Defect in converter power supply.	Check power connections to POWER connector (fig. 29). Check converter power supply (*b* below).
2	Filaments on, but no meter indications.	No B+ voltage applied to tubes.	Check converter power supply (*b* below).
3	No peak meter indication on meter when control C2 REF-B on oscillator assembly is adjusted.	Defective tube in oscillator assembly.	Check buffer amplifier tube V2.
4	No peak meter indication on meter when control C3 REF-B on oscillator assembly is adjusted.	Defective tube in oscillator assembly.	Check frequency tripler tube V3.
5	No peak meter indication on meter when control C4 REF-B on oscillator assembly is adjusted.	Defective tube in oscillator assembly.	Check buffer amplifier tube V4.
6	No peak meter indication on meter when control C6 on multiplier assembly is adjusted.	Defective tube in multiplier assembly.	Check frequency doubler tube V1 by replacement (para 50).
7	No peak meter indication on meter when control C14 REF-D on multiplier assembly is adjusted.	Defective tube in multiplier assembly.	Check amplifier tube V2 by replacement (para 50).
8	No peak meter indication on meter when control C22 REF-E on multiplier assembly is adjusted.	Defective tube in multiplier assembly.	Check frequency doubler V3 by replacement (para 50).
9	No peak meter indication on meter when control F on multiplier is adjusted.	Defective tube in multiplier assembly.	Check frequency tripler V4 by replacement (para 50).
10	No peak meter indication on meter when control G on varactor multiplier is adjusted.	Defect in varactor multiplier circuit.	Higher category repair required.
11	Meter does not indicate at SET POINT when METER FUNCTION SELECTOR switch is set at H-XTAL CUR.	XTAL CURRENT ADJUST control incorrectly set.	Adjust XTAL CURRENT ADJUST control for SET POINT indication on meter.
12	Meter indication above 100 when METER FUNCTION SELECTOR switch is set at H-XTAL CUR.	Loss of agc voltage	Check V1 through V3 in converter power supply (fig. 20).
13	Meter does not indicate 50 when METER FUNCTION SELECTOR switch is set to J-TUN. DET. and TUNE-UP SIGNAL button is pressed.	Preselector or phase shifter stages are tuned incorrectly.	Check tuning of preselector and phase shifter (TM 11-5820-469-10).

b. Converter Power Supply Troubleshooting Chart (fig. 20). The converter power supply provides the B+ requirements of the receive converter (*a* above). Alternating-current (ac) power for the filament circuits within the receive converter is routed through 5-ampere fuse F1 and applied direct to the receive converter. The chassis also contains a chopper assembly and a three-tube automatic gain control (agc) control circuit that provides agc control voltage to the receive converter. Troubleshooting of the agc control circuit is covered in the receive converter troubleshooting chart (item 12, *a* above). Before starting the check, be sure that both the INJ and PWR switches are set to ON.

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
1	PWR switch set to ON but PWR indicator does not light.	Defective fuse or pilot lamp	Check fuses F1 and F4. Check PWR indicator lamp.
		Poor or defective connection at rear panel connector J4.	Check pins P and T of connector J4 on rear panel of converter power supply.
2	TD indicator lamp does not light 30 seconds after PWR switch is set to ON.	Defective fuse or pilot lamp	Check fuse F2. Check TD indicator lamp.
		Defective rear panel connection.	Check connections on rear panel of converter power supply.
		Defective time delay relay K1.	Higher category repair required.
3	PWR SUP indicator does not light.	Defective lamp or fuse	Check fuses F3 and F4. Check PWR SUP indicator lamp.
		Defect in 200-volt power supply.	Check B+ voltage at jack J1 for +200 volts. If no voltage at J1, higher category repair is required.
4	INJ indicator does not light (INJ switch set to ON).	Defective lamp	Replace INJ indicator lamp.

30.1 Modified Receive Converter and Converter Power Supply Troubleshooting Chart, AN/TRC-80A

(fig. 19.1)

a. Receive Converter Troubleshooting Chart. Amplifier-Converter AM-6099/TRC-80A (AN/TRC-80A receive converter) accepts two input signals; one is a 4.5- to 5-gigacycle (ggc) modulated signal from the distant AN/TRC-80 or AN/TRC-80A, and the other is a 1,082.5- to 1,232.4875-mc signal from the 0-1462A/TRC synthesizer used with the receive converter. The output of the receive converter is a 70-mc signal that is applied to the if. amplifier unit. To determine if the defect is in the receive converter or in another receiver unit, set the METER FUNCTION SELECTOR switch to the J-TUN. DET. position and press the TUNE-UP SIGNAL button. If an indication of 50 is obtained on the panel meter, the trouble is probably external to the receive converter. If no meter indication is obtained, check the tuneup oscillator/mixer (fig. 19.1). Retune the AN/TRC-80A receive converter as directed in the tuning procedure (TM 11-5820-469-10) until an abnormal indication is obtained. Refer to the trouble symptom that corresponds to the abnormal indication, and perform the recommended checks and corrective measures.

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
1	No meter indications	Defective power input connection. Defect in converter power supply.	Check power connections to POWER connector (fig. 29). Check converter power supply (*b* below).
2	No peak meter indication on meter when control G on varactor multiplier is adjusted.	Defect in varactor multiplier circuit.	Higher category repair required.
3	Meter indication excessive when METER FUNCTION SELECTOR switch is set at H-XTAL CUR.	Excessive input power from 0-1462A/TRC synthesizer.	Reset 0-1462A/TRC synthesizer POWER OUTPUT control.
4	Meter does not indicate 50 when METER FUNCTION SELECTOR switch is set to J-TUN. DET. and TUNE-UP SIGNAL button is pressed.	Preselector or phase shifter stages are tuned incorrectly.	Check tuning of preselector and phase shifter (TM 11-5820-469-10).

b. Converter Power Supply Troubleshooting Chart. The converter power supply provides the B+ requirements of the AN/TRC-80A receive converter (*a* above).

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
	Power switch set to ON but POWER indicator does not light.	Defective fuse or pilot lamp. Poor or defective connection at rear panel connector J4.	Check fuses F1. Check POWER indicator lamp. Check connector J4 on rear panel of converter power supply.

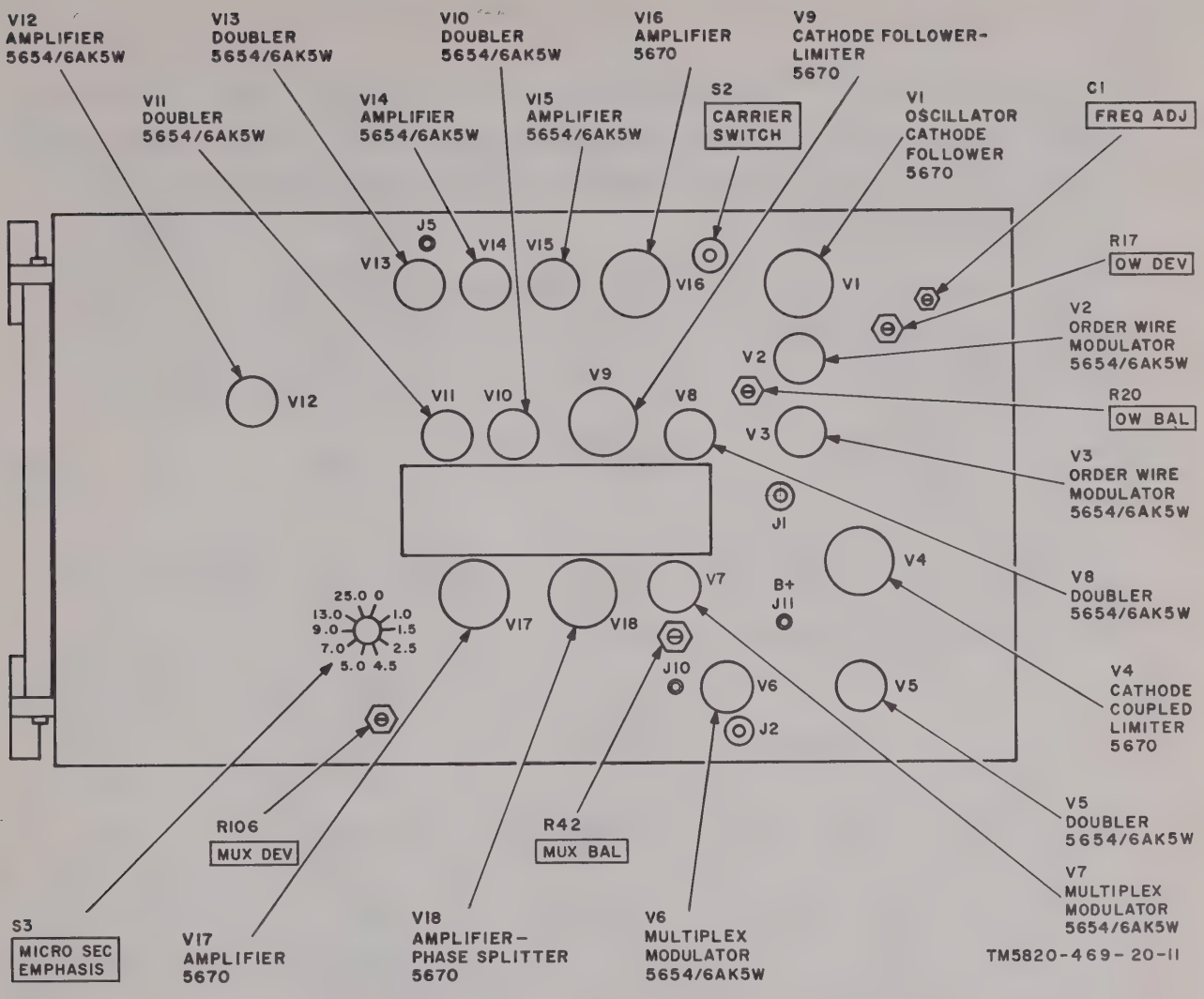

Figure 14. Modulator-multiplier, location of tubes and adjustment points.

31. If. Power Supply Troubleshooting Chart

The if. power supply contains three transistorized 200-volt power supplies, A1 through A3. These supplies are not stocked at organizational levels and must be replaced by higher echelon maintenance. The organizational maintenance repair of the if. power supply is limited to checking of fuses, pilot lamps, and rear panel connector J5. The fuse and panel lamp location diagram is illustrated in figure 29 of TM 11-5820-469-10.

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
1	POWER switch is set to ON but POWER indicator is not lighted.	Defective fuse or lamp. Poor connection at J5 on rear panel of if. power supply.	Check F1 and POWER indicator lamp. See that P3 is properly inserted in J5 on rear panel of if. power supply.
2	TIME DELAY indicator lamp does not light 30 seconds after POWER switch is set to ON.	Defective fuse or lamp --------- Defective time delay relay K1 ---	Check F2 and TIME DELAY indicator lamp. Higher echelon required.
3	Indicator A1 does not light-------	Defective fuse or lamp ---------	Check F4 and F8. Check indicator lamp.

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
4	Indicator A2 does not light	Defective fuse or lamp	Check F5 and F9. Check indicator lamp.
5	Indicator A3 does not light	Defective fuse or lamp	Check F6 and F10. Check indicator lamp.
6	Tubes V1, V2, and V3 in discriminator combiner subchassis of if. amplifier panel (fig. 21) do not light. Other filaments normal.	No. -6.3-volt dc power	Check fuse F7.
7	All tube filaments are out except in tubes V1, V2, and V3 in discriminator combiner subchassis of if. amplifier panel.	No. 6.3-volt ac filament power	Check F3.

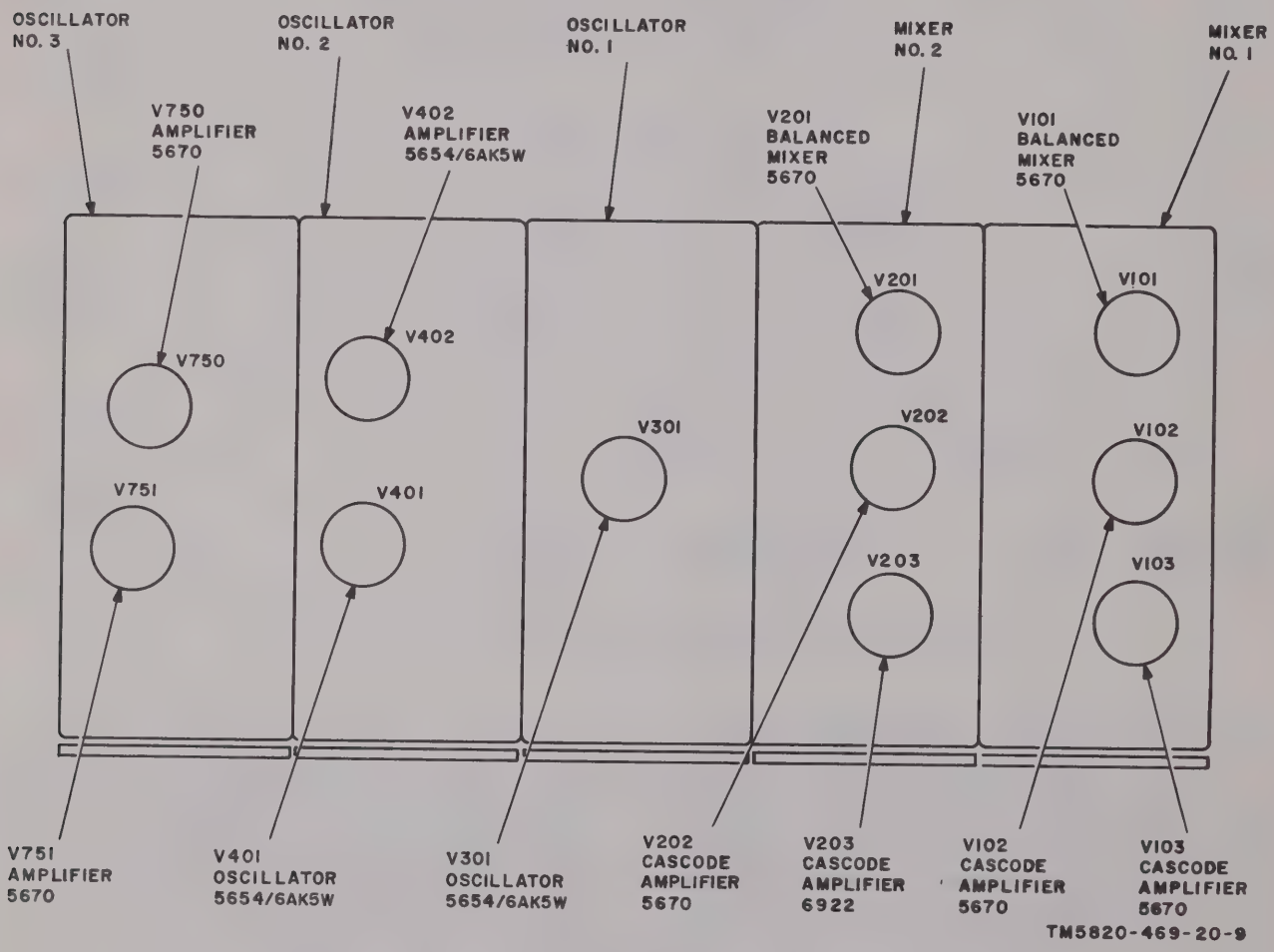

Figure 15. Synthesizer, tube location diagram.

32. If. Amplifier Troubleshooting Chart

The if. amplifier unit contains the five subchassis illustrated in figure 10 and 21. Troubleshooting of the if. amplifier at the organizational level is confined to the use of the monitor meter (located in rack A1) and the meter on the 8-mc if. No. 2 subchassis to localize defects to a subchassis. When tube replacement and an interchassis connector check do not restore normal operation, higher echelon maintenance is required.

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
1	Filament in tubes V1, V2, and V3 in discriminator combiner subchassis not lighted. Other filaments normal.	No. -6.3-volt input from if. power supply.	Refer to item 6 of if. power supply troubleshooting chart (para 31).
2	All tube filaments are out except in tubes V1, V2, and V3 in discriminator combiner subchassis.	No. 6.3-volt ac input from if. power supply.	Refer to item 7 of if. power supply troubleshooting chart (para 31).
3	No output from receiver. (No meter indication on monitor meter when monitor selector switch S2 is set to D.)	*a.* No 70-mc input from receive converter.	*a.* Check connection to J1 (fig. 30) on rear panel of if. amplifier chassis. Refer to paragraphs 38*c* and 39*b* and check subchassis cable connections.
		b. Defective tube in one of if. stages.	*b.* Push TUNE-UP SIGNAL button on receive converter and check for deflection of if. amplifier meter with switch S1 at REC GAIN 6. If deflection is normal, trouble is probably in discriminator combiner subchassis. If there is no deflection, check tubes in converter, bandwidth, and 8-mc if. subchassis.

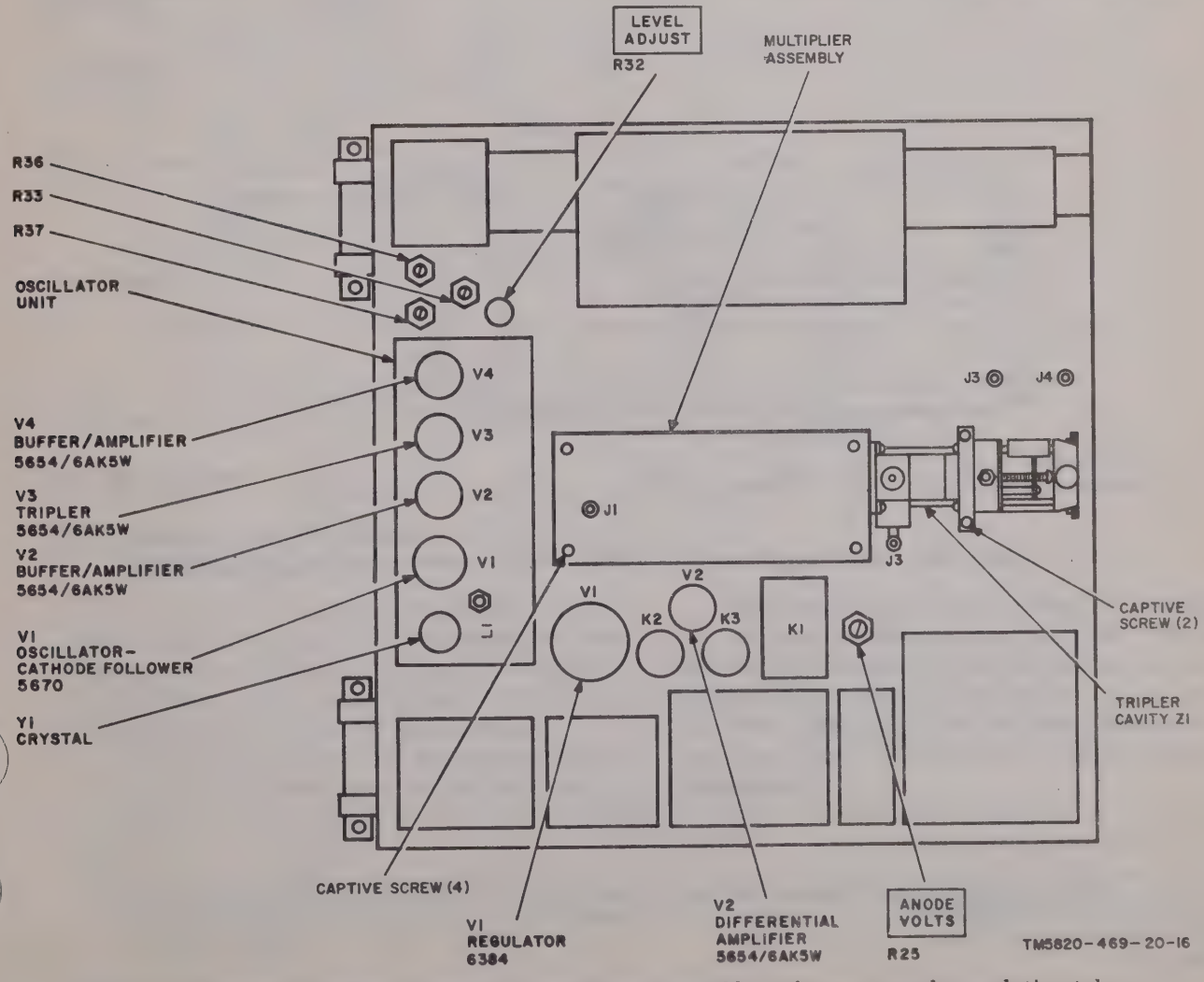

Figure 16. Transmit converter, location of oscillator assembly and power supply regulation tubes.

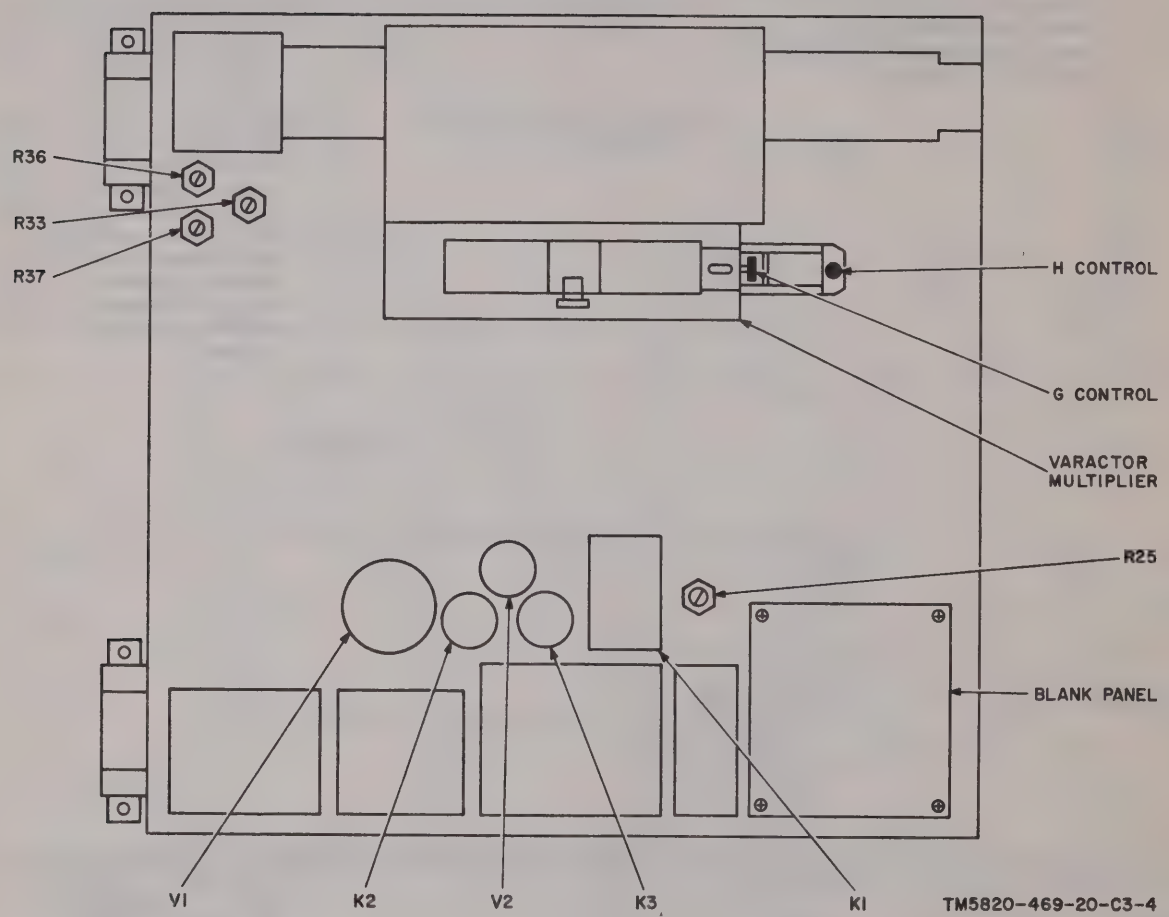

Figure 16.1. *Amplifier-Converter AM-4917/TRC, component location (AN/TRC-80A).*

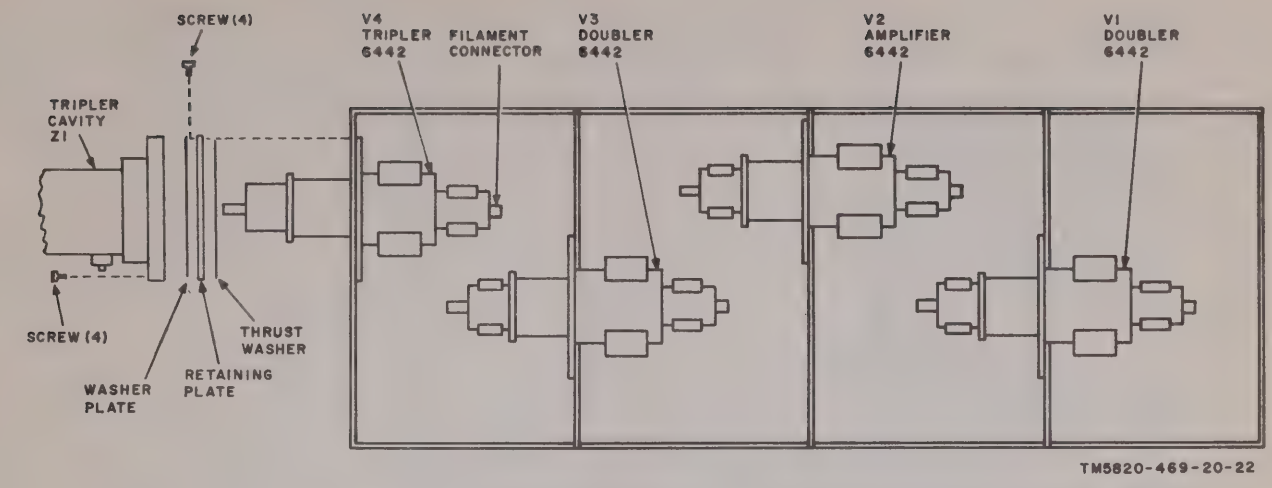

Figure 17. Transmit converter, location of multiplier assembly tubes (bottom cover removed).

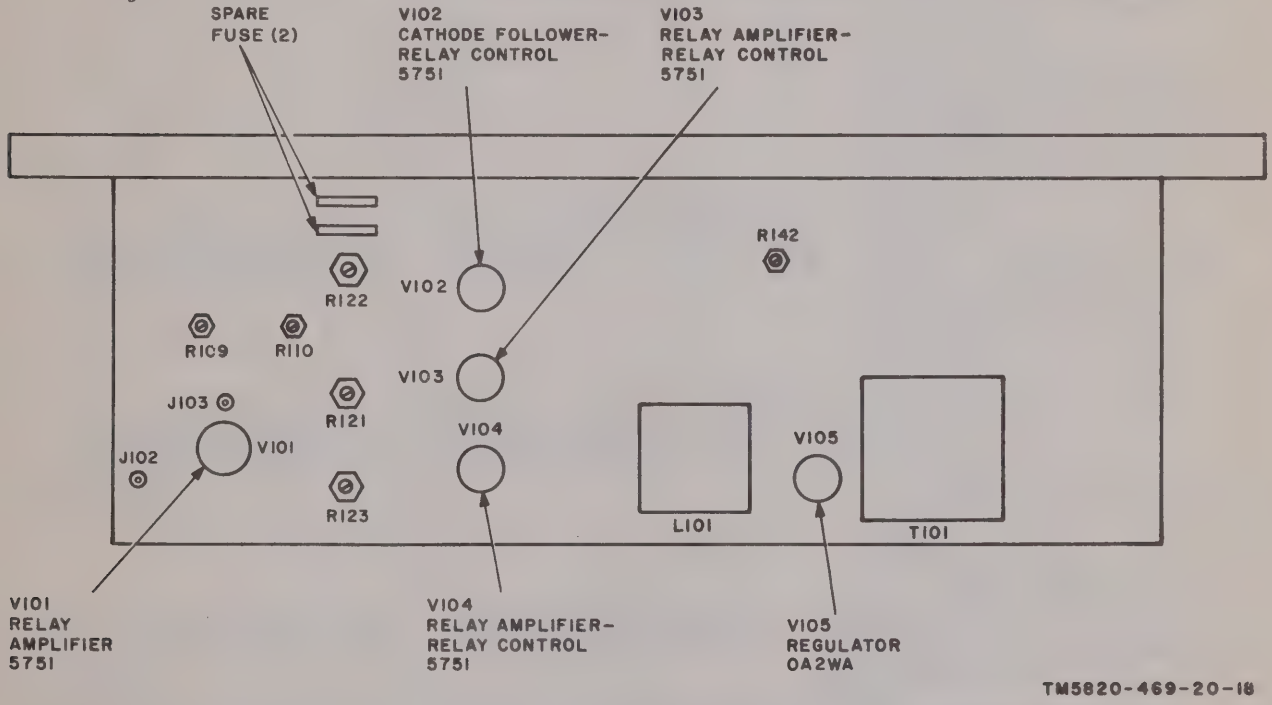

Figure 18. Power amplifier control panel, top view, location of tubes and adjustment points.

33. Communication Facilities Troubleshooting Chart

All radio and landline communications from and to the AN/TRC-80 are controlled from the control panel. With the exception of checking cable connections to the control panel and replacing panel lamps (TM 11-5820-469-10), troubleshooting of this unit is performed by higher category maintenance. Sequence No. 27 through 35 of the quarterly maintenance checks and services chart (para 8) check the various communication facilities of the AN/TRC-80. The chart below lists the corrective measures to perform when trouble develops.

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
1	Communication difficulty on radio circuit (weak reception or poor transmission).	Transmitter or receiver requires adjustment.	Check transmit circuits: a. Push TEST SIGNAL pushbutton on control panel and check for SET

Item No.	Trouble symptom	Probable trouble	Checks and corrective measures
			POINT indication on monitor with switch S2 in position A. *b.* Set REFLECTED INCIDENT switch to INCIDENT and check pa POWER OUT meter for normal indication (greater than 0.8 kw). If indication is less than 0.8 kw, refer to TM 11-5820-469-10 and retune power amplifier. Check receive circuits: *a.* Push TUNE-UP SIGNAL button on receive converter and check for full deflection of if. amplifier meter with switch S1 at RCVR GAIN 6. *b.* Place receive converter METER FUNCTION SELECTOR switch to J-TUN. DET. *c.* Push TUNE-UP SIGNAL button and check for sharp increase in meter indication. If normal indications are not obtained, refer to TM 11-5820-469-10 and retune receive section of AN/TRC-80.
2	Pts speech and radio teletypewriter communication with distant AN/TRC-80 not possible.	AN/TRC-80 not tuned correctly, or equipment connections incorrect.	*a.* Check transmit and receive circuits as in item 1 above. *b.* Check cable connections at power and signal entry panel (fig. 33, TM 11-5820-469-10) PROGRAMMER TEST STATION jack J3 and TTY (PTS) jacks and J31 and J32.
3	Three-party dc teletypewriter communication between pts, Army, and AN/TRC-80 operator not possible.	Defective TH-5A/TG or teletypewriter, or equipment is connected incorrectly.	*a.* Check TH-5A/TG (TM 11-5805-246-20). *b.* Check pts cable and army 2-wire connections at power and signal entry panel jacks J3, J25, and J26. *c.* Check TTY (PTS) jacks J31 and J32. Check teletypewriter circuits (TM 11-5815-206-12).
4	Speech communication with Army on 2W/4W telephone circuit not possible.	Poor or wrong connection on power and signal entry panel.	Check 2-wire (or 4-wire) telephone connections to power and signal entry panel jacks J17, J18, J19, and J20.
5	Teletypewriter communication with Army on vf teletypewriter circuit not possible.	Defective TH-5A/TG or teletypewriter, or equipment is connected incorrectly.	*a.* Check TH-5A/TG (TM 11-5805-246-20). *b.* Check teletypewriter circuits (TM 11-5815-206-12). *c.* Check 2-wire (or 4-wire) teletypewriter connections to power and signal panel jacks J23, J24, J25, and J26.
6	Speech communication with pts not possible.	Poor or wrong connection on power and signal entry panel.	*a.* Check connections to DISCRETE (PTS) jacks J27 and J28. *b.* Check connections at power and signal entry panel PROGRAMMER TEST STATION jack J3.
7	Speech communication with pts over intercom circuit not possible.	Poor or wrong connection on power and signal entry panel.	Check connections to INTERCOM (PTS) jacks J29 and J30 on power and signal entry panel.
8	Speech communication with vehicular radio circuit not possible.	Defect in radio equipment used with vehicle, or poor or wrong connection on power and signal entry panel.	Check radio equipment associated with vehicle. Check connections to J7 on power and signal entry panel.

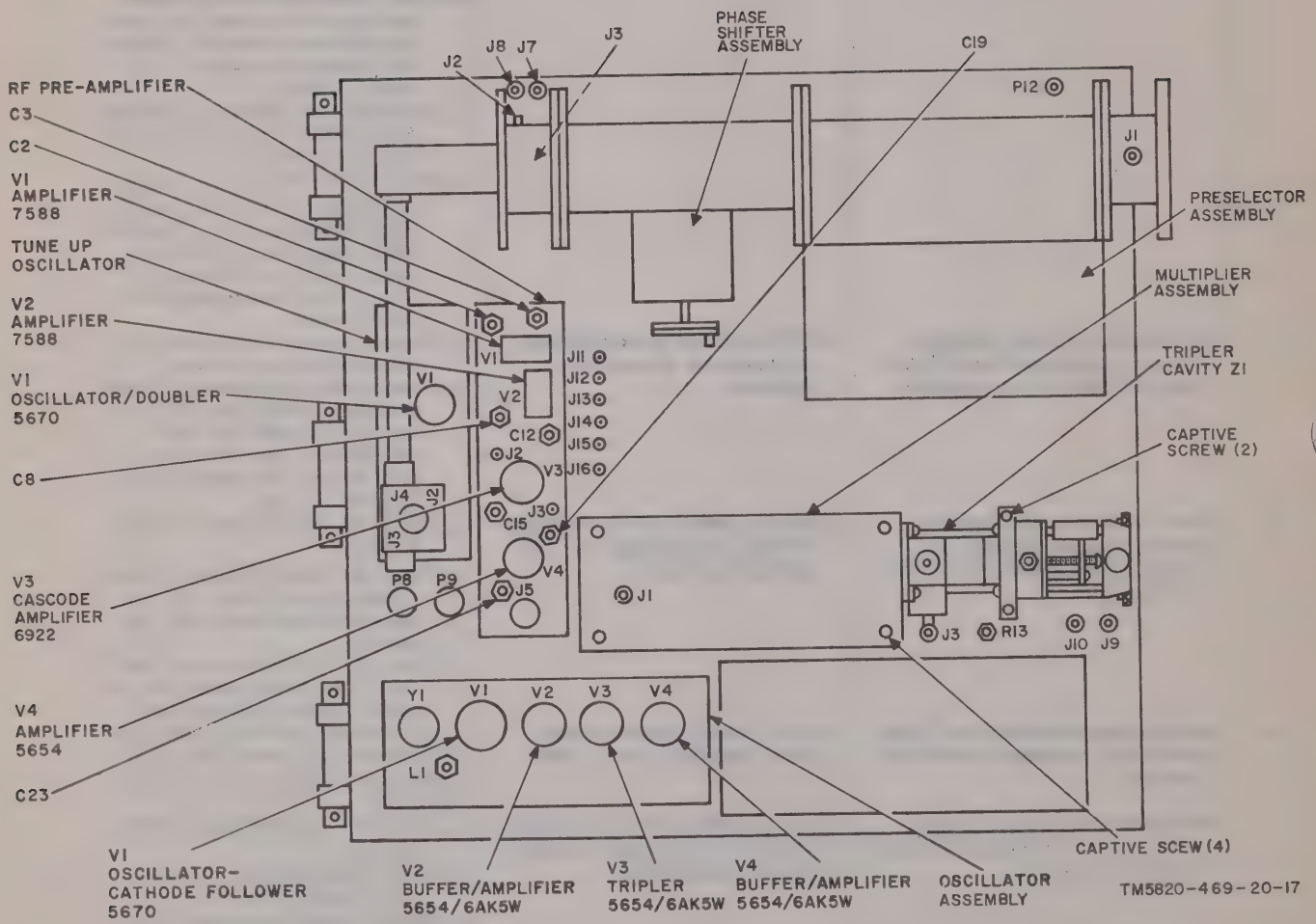

Figure 19. Receive converter, tube location diagram.

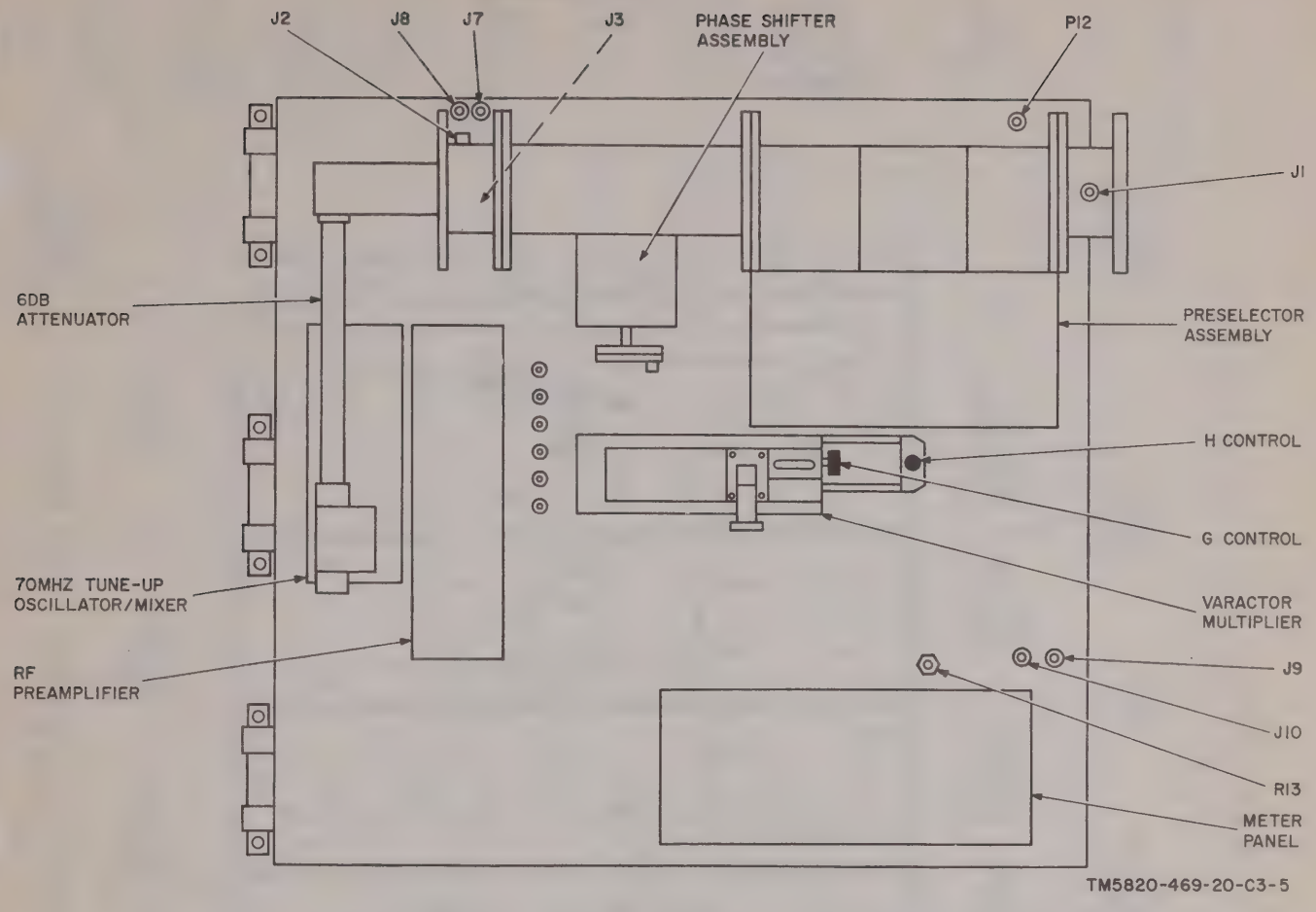

Figure 19.1. Amplifier-Converter AM-6099/TRC-80A, component locations (AN/TRC-80A).

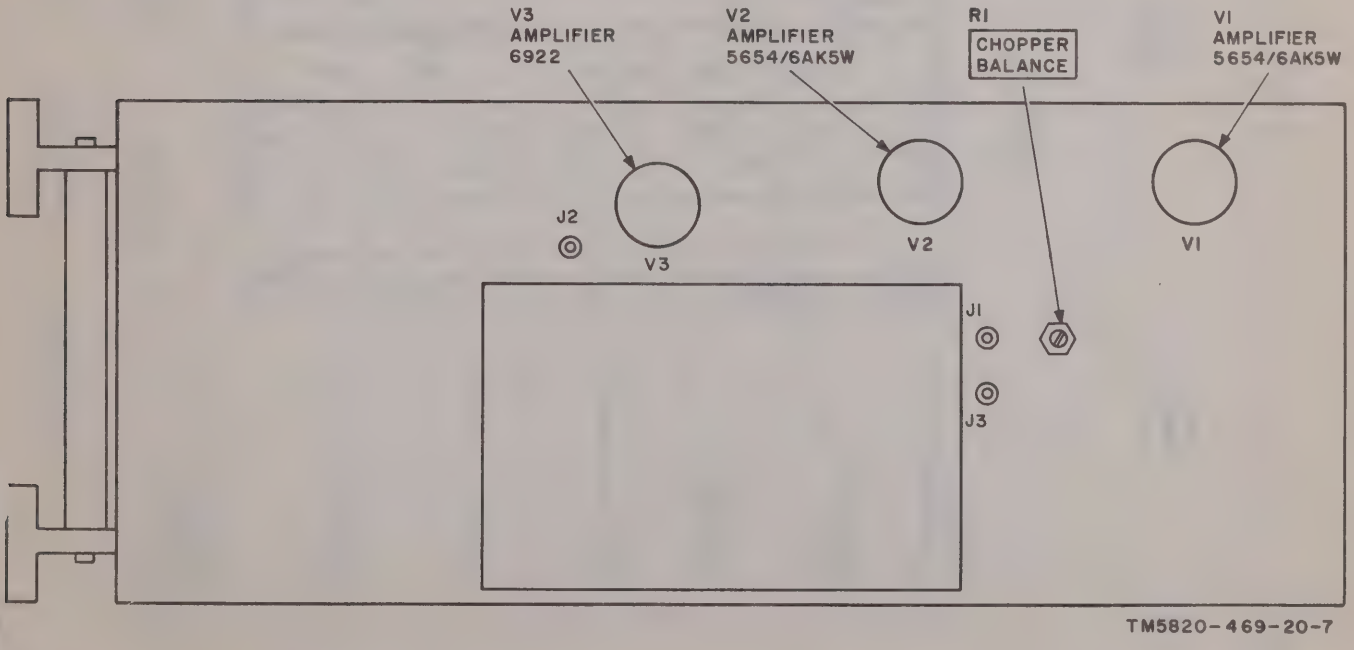

Figure 20. Converter power supply, tube and test point location.

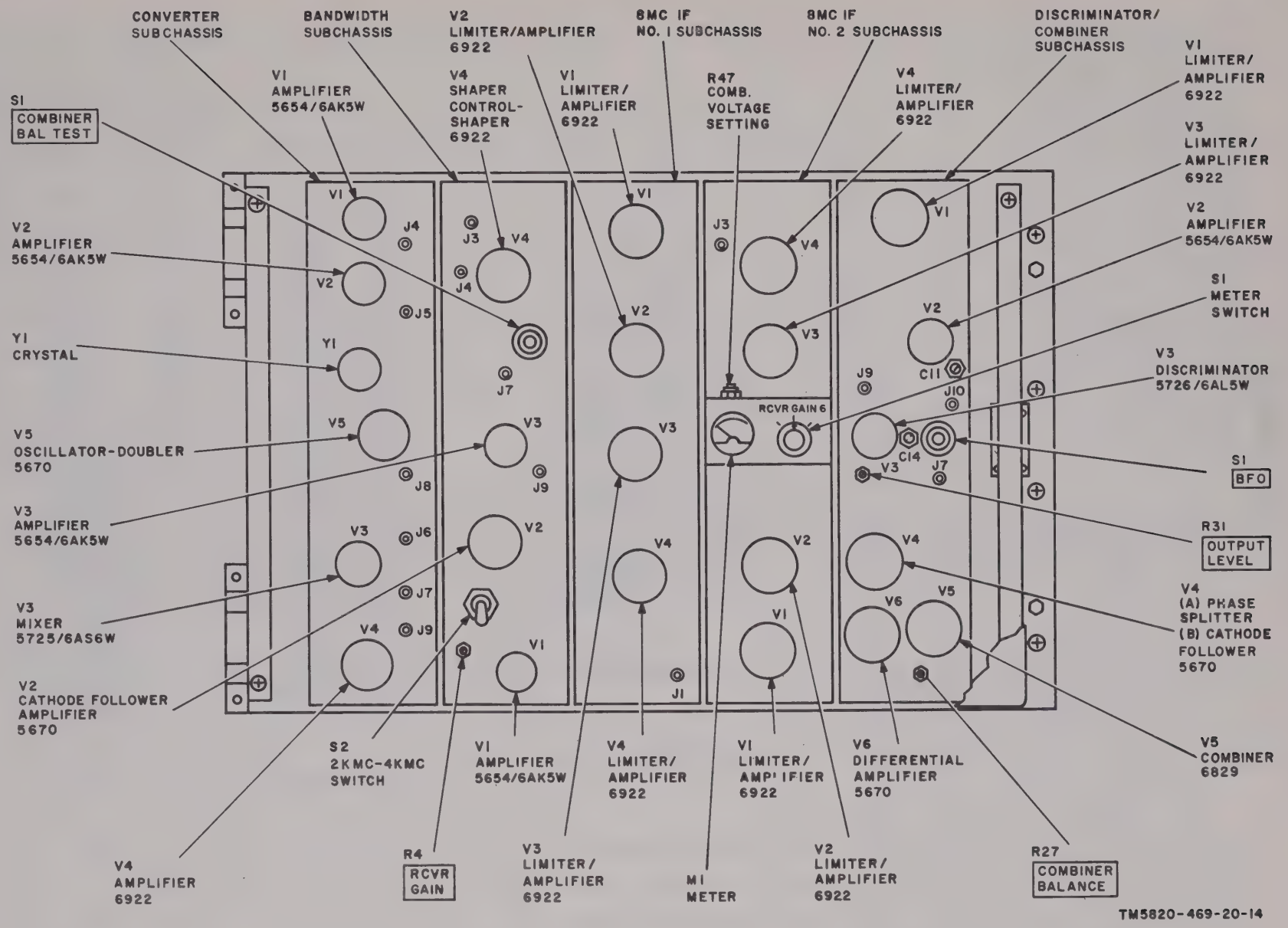

Figure 21. If. amplifier, location of subchassis, tubes and test points.

Section IV. COAXIAL CABLES AND CONNECTIONS

34. General

The coaxial cable connections between the various racks and chassis are listed in this section and are illustrated in figure 39. The cabling is connected between the individual equipment unit cable connectors and the terminal panels at the top of each rack. The rack terminal panels are interconnected by coaxial cabling to complete the equipment coaxial interconnections. Rack A5 has no coaxial cables connected to the terminal panel. Coaxial cables from the equipment units in rack A5 connect to the terminal panel in rack A4. The terminal panel of rack A4 is shown in figure 28. The REMOTE connector on the switch panel is used in diversity operation and is connected to RECEIVER INTERCONNECT jack J8 on the power and signal entry panel. A coaxial cable connects the transmit converter output direct to the input of the power amplifier. The coaxial cable connector locations on the rear of each equipment unit chassis are shown in figures 22 through 31. The power amplifier cable connector locations are shown in figures 33 and 34.

Note: All cables are prefixed with a 31W designation. For example, cable number 57 is labeled 31W57.

35. Rack A1

a. Terminal Panel (fig. 39).

Cable No.	Plug	Terminal board	Jack	Cable function
43	P2	TB16	J3	Rack interconnect to rack A2.
52	P2	TB16	J4	70-mc output of modulator-multiplier.
51	P2	TB16	J4	70-mc signal to transmit converter.
53	P2	TB21	J1	Voice and radio teletypewriter input to multiplexer.
20	P2	TB21	J1	Recd voice and radio teletypewriter input from rack A4.
54	P2	TB21	J2	Voice and radio teletypewriter output from multiplexer.
41	P2	TB21	J2	Voice and radio teletypewriter output to rack A2.
55	P2	TB21	J3	External oscillator signal to transmit converter.
27	P2	TB21	J3	External oscillator signal from rack A3.
56	P2	TB21	J4	Voice and radio teletypewriter output to modulator-multiplier.
40	P2	TB21	J4	Voice and radio teletypewriter output from rack A2.

b. Monitor (fig. 22 and 39)

Cable No.	Plug	Jack	Cable function
62	P1	J1	Line voice monitor signal from multiplexer.
58	P1	J2	Voice and radio teletypewriter output monitor signal from multiplexer.
57	P1	J3	Voice and radio teletypewriter input monitor signal from multiplexer.
59	P1	J4	Line voice output monitor signal from multiplexer.
61	P1	J5	Transmit radio teletypewriter monitor signal from multiplexer.
60	P1	J7	Line radio teletypewriter output monitor signal from multiplexer.
63	P2	J8	70-mc output monitor signal from modulator-multiplier.

c. Transmit Converter (fig. 23 and 39)

Cable No.	Plug	Jack	Cable function
51	P1	J5	70-mc input signal from terminal panel.
64	P1	J7	Output signal to power amplifier.
55	P1	J6	External oscillator signal input from terminal panel.

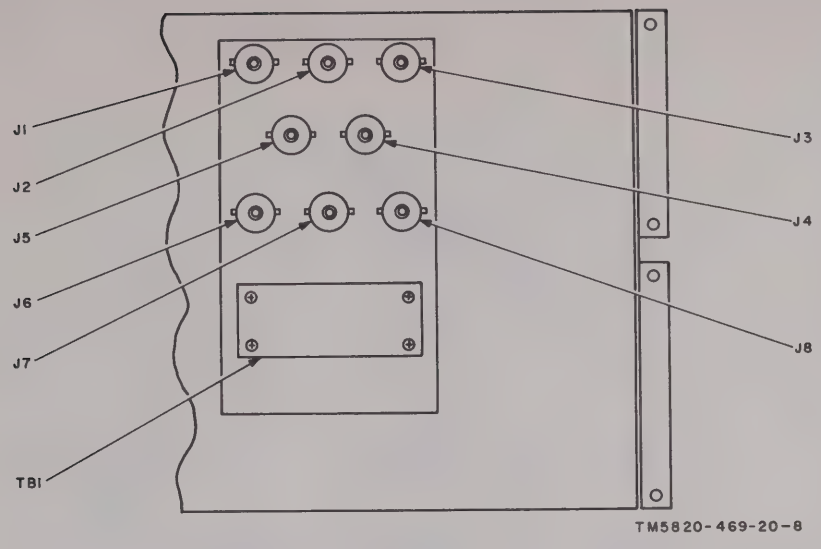

Figure 22. Monitor, rear panel view, location of terminal board and jacks.

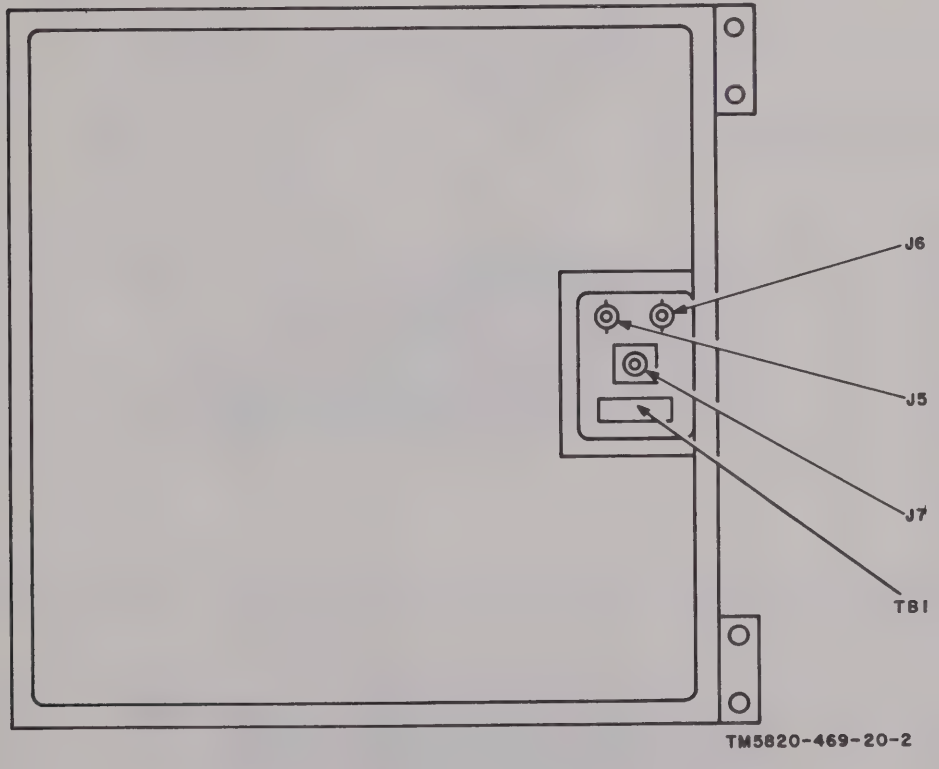

Figure 23. Transmit converter, rear panel view, location of terminal board and jacks

d. *Modulator-Multiplier* (fig. 24 and 39)

Cable No.	Plug	Jack	Cable function
52	P1	J6	70-mc output signal to terminal panel.
63	P1	J7	70-mc output monitor signal to monitor.
56	P1	J8	Voice and radio teletypewriter output from terminal panel.

Note: Jack J9 MUX INPUT is not used in the AN/TRC-80 when used as part of the Pershing Weapons System. In this system voice and radio teletypewriter multiplex signals are cabled through OW INPUT J8.

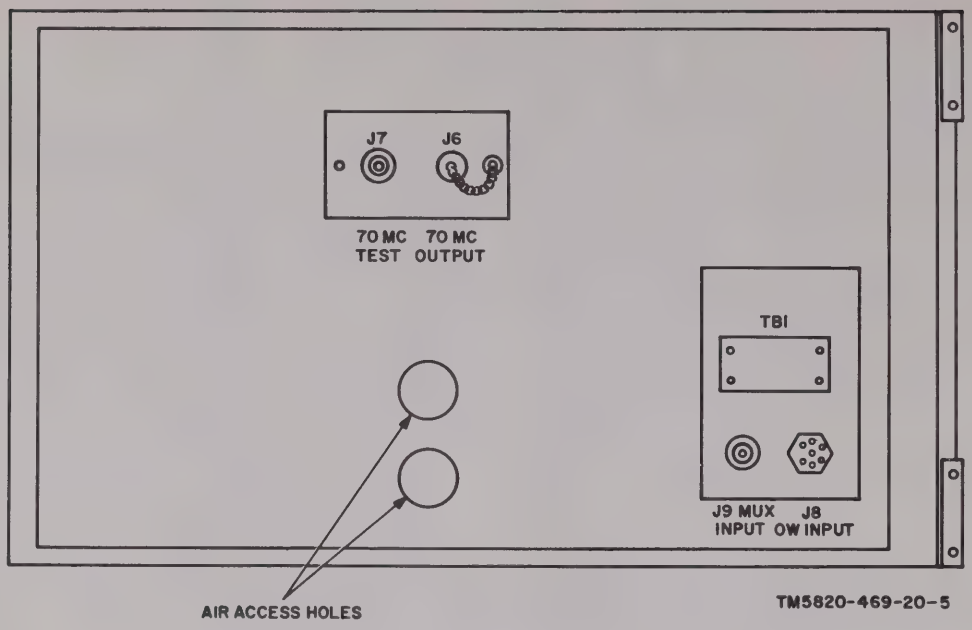

Figure 24. Modulator-multiplier, rear panel view, location of terminal board and jacks.

e. *Multiplexer* (fig. 25 and 39).

Cable No.	Plug	Jack	Cable function
62	P2	J1	Line voice input monitor signal to monitor.
61	P2	J2	Line input monitor signal to monitor.
60	P2	J3	Line radio teletypewriter output monitor signal to monitor.
59	P2	J4	Line voice output monitor signal to monitor.
58	P2	J5	Voice and radio teletypewriter output monitor signal to monitor.
54	P1	J6	Voice and radio teletypewriter output to terminal panel.
57	P2	J7	Voice and radio teletypewriter input monitor signal to monitor.
53	P1	J8	Voice and radio teletypewriter input from terminal panel.

36. Rack A2

a. *Terminal Panel* (fig. 39).

Cable No.	Plug	Jack	Cable function
44	P2	J5	Transmit voice and radio teletypewriter from switch panel.
40	P1	J5	Transmit voice and radio teletypewriter to rack A1.
45	P2	J6	Transmit voice and radio teletypewriter to multiplexer.
41	P1	J6	Transmit voice and radio teletypewriter from rack A1.
46	P2	J7	Receive converter No. 1 output to switch panel.
21	P1	J7	Receive converter No. 1 output from rack A5 through rack A4 terminal panel.
47	P2	J8	Receive converter No. 2 output to switch panel.
23	P1	J8	Receive converter No. 2 output from rack A4.
48	P2	J1	Remote if. tieline to switch panel.
42	P1	J1	Remote if. tieline to power and signal entry panel RECEIVER INTERCONNECT jack J8.
49	P2	J2	If. input No. 2 from switch panel.
25	P1	J2	If. input No. 2 to rack A4.
43	P1	J3	Rack interconnect to rack A1.
50	P2	J4	If. input No. 1 from switch panel.
16	P1	J4	If. input No. 1 to rack A5 through rack A4.

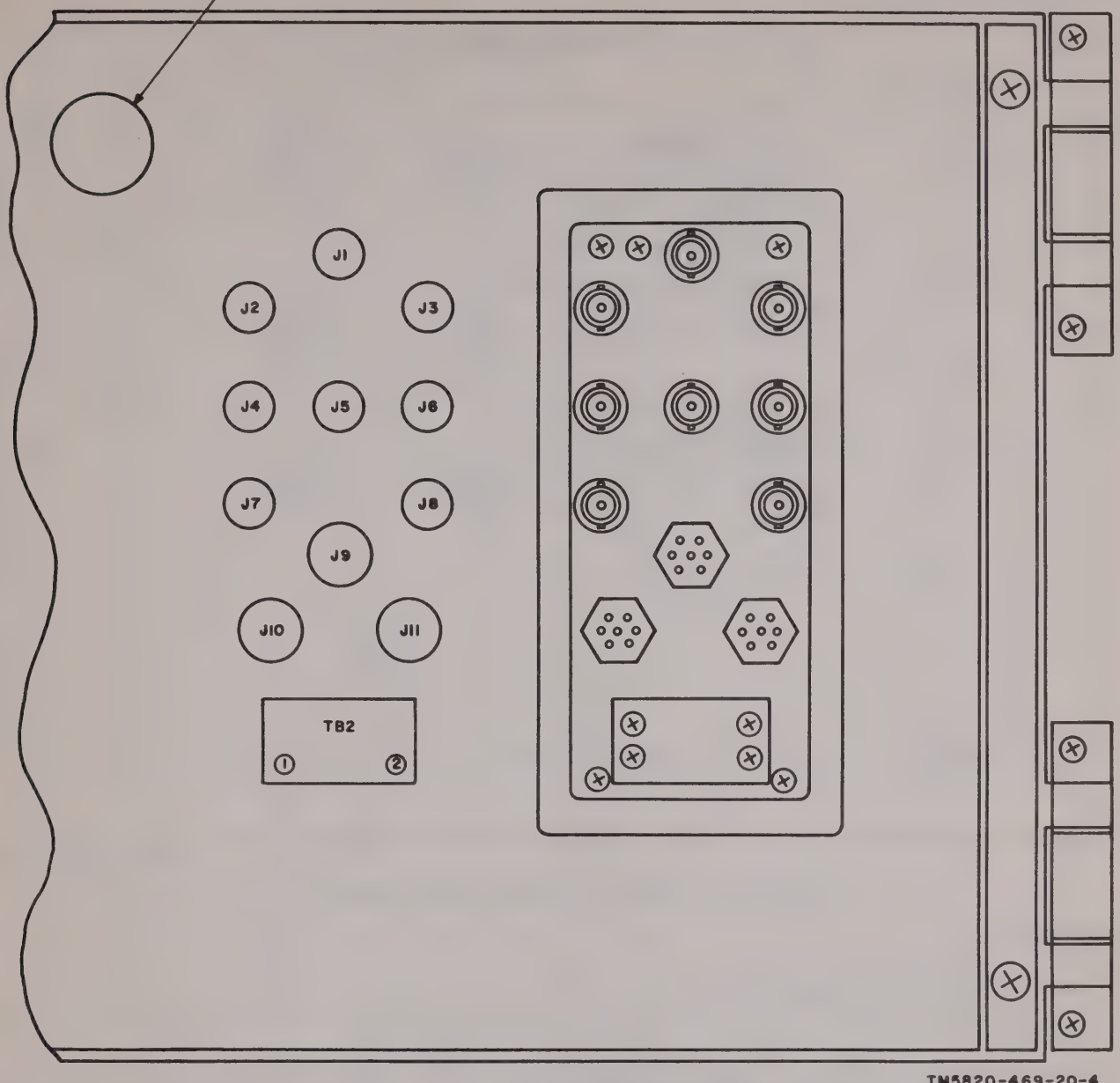

Figure 25. Multiplexer, rear panel view, location of terminal board and jacks.

b. Switch Panel (fig. 26 and 39).

Cable No.	Plug	Jack	Cable function
46	P1	J1	Receive converter No. 1 output from terminal panel.
47	P1	J2	Receive converter No. 2 output from terminal panel.
49	P1	J3	If. in No. 2 to terminal panel.
50	P1	J4	If. in No. 1 to terminal panel.
48	P1	J5	Remote if. tieline to terminal panel.
45	P1	J6	Transmit voice and radio teletypewriter from terminal panel.
44	P1	J7	Transmit voice and radio teletypewriter to terminal panel.

Note: Two cables, 31W69 and 31W70, are used for front panel interconnection of IF IN, RECEIVER OUT, and REMOTE jacks (fig. 23, TM 11-5820-469-10).

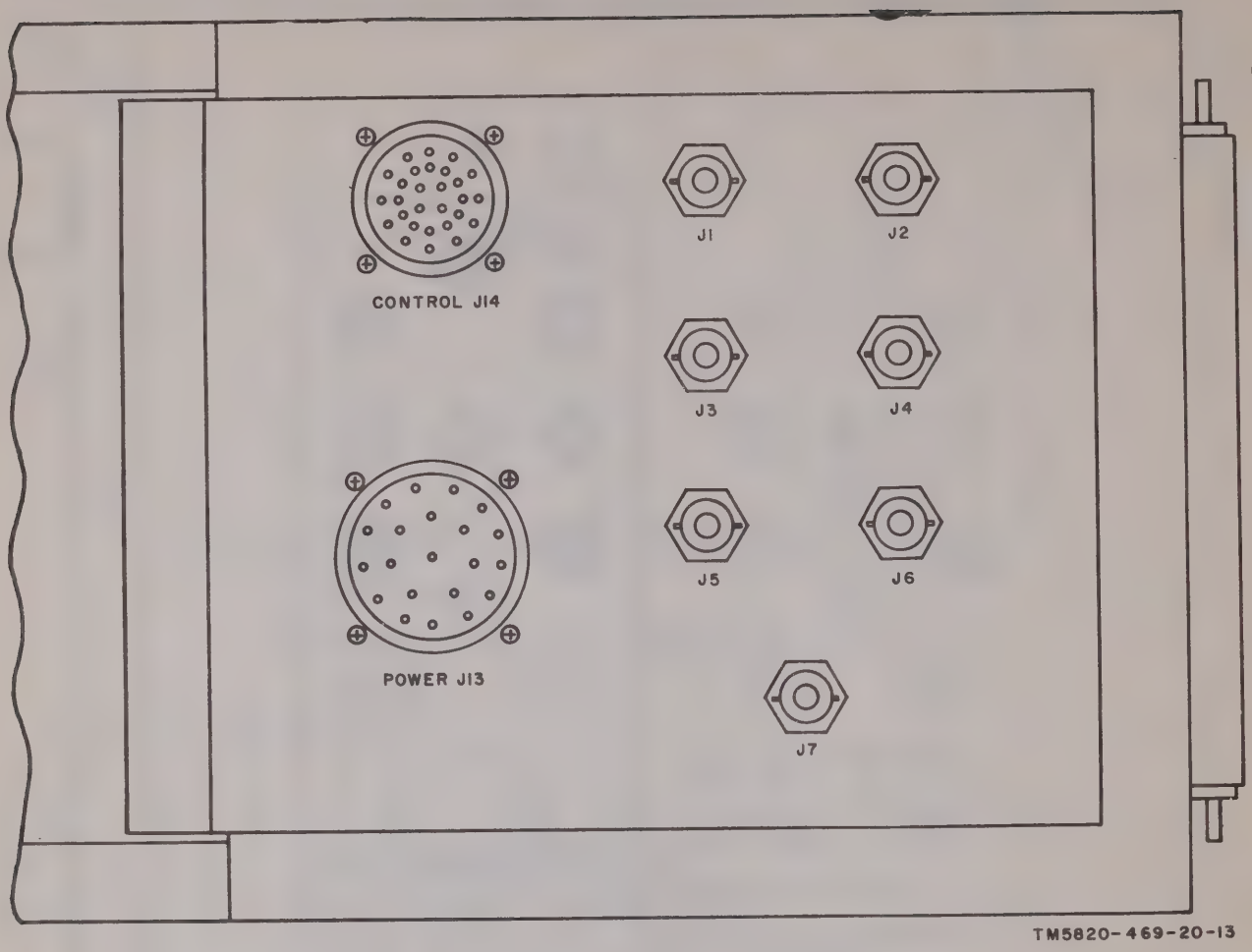

Figure 26. Switch panel, rear view, connector and jack location.

37. Rack A3

a. *Terminal Panel* (fig. 39).

Cable No.	Plug	Jack	Cable function
28	P2	J1	Output from upper synthesizer.
22	P1	J1	Synthesizer output to rack A5 through rack A4 terminal panel.
30	P2	J3	Output from center synthesizer.
27	P1	J3	Synthesizer output to rack A1.
29	P2	J2	Output from lower synthesizer.
24	P1	J2	Synthesizer output to rack A4.

b. *Synthesizers,* AN/TRC-80 Only (fig. 27 and 39).

Cable No.	Plug	Jack	Cable function
28	P1	J604-1	External oscillator signal to receive converter No. 1 (rack A5) through terminal panel.
30	P1	J604-2	External oscillator signal transmit converter (rack A1) through terminal panel.
29	P1	J604-3	External oscillator signal to receive converter No. 2 (rack A4) through terminal panel.

b.1. O-1462A/TRC Synthesizer, AN/TRC-80A Only (fig. 27.1 and 39.1).

Cable No.	Plug	Jack	Cable function
28	P1	J36-1	External oscillator signal to AN/TRC-80A receive converter No. 1 (rack 5) through terminal panel.
29	P1	J36-2	External oscillator signal to AN/TRC-80A transmit converter (rack 1) through terminal panel.
30	P1	J36-3	External oscillator signal to AN/TRC-80A receive converter No. 2 (rack 4) through terminal panel.

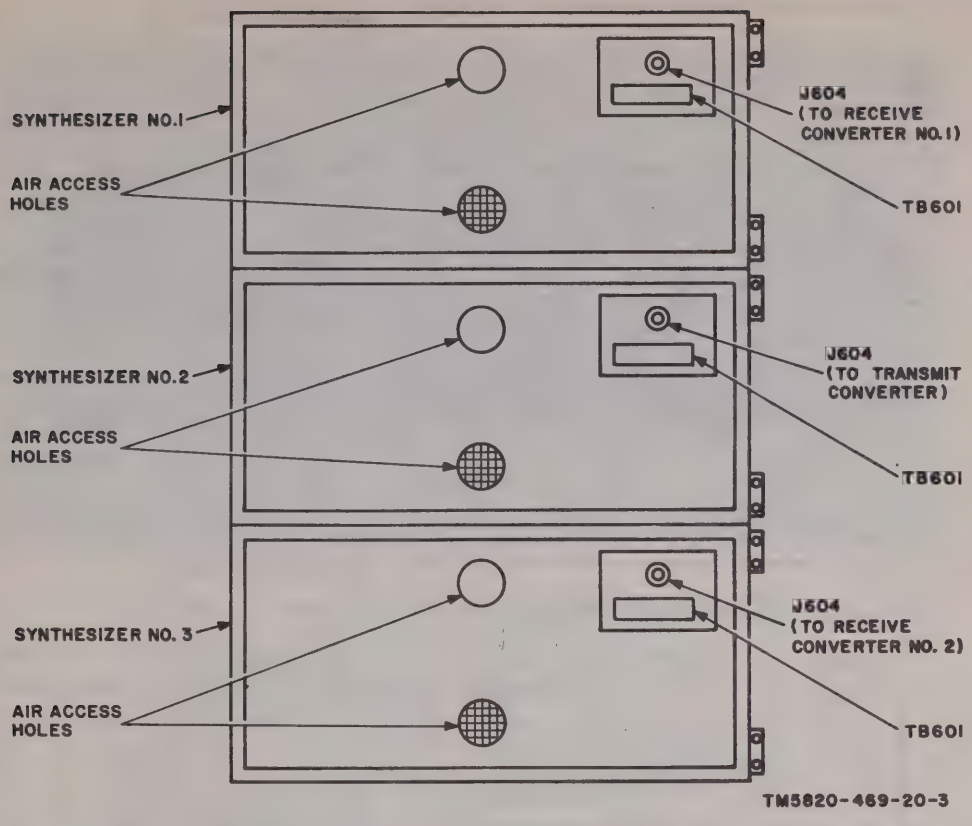

Figure 27. Synthesizers, rear view, location of jacks and terminal boards.

38. Rack A4

a. *Terminal Panel* (fig. 28 and 39 or 39.1).

Cable No.	Plug	Terminal board	Jack	Cable function
1	P2	TB11	J1	If. signal to amplifier No. 1 (rack A5).
16	P2	TB11	J1	If. signal from rack A2 (switch panel).
18	P2	TB11	J4	If. output interconnect from/to if. amplifier No. 1.
4	P2	TB11	J4	If. output interconnect from/to if. amplifier No. 2.
19	P2	TB16	J1	Combiner interconnect from/to if. amplifier No. 1 (V5B).
5	P2	TB16	J1	Combiner interconnect from/to if. amplifier No. 2 (V5B).
6	P2	TB16	J2	If. output from if. amplifier No. 2.
20	P2	TB16	J2	If. output to rack A1 (multiplexer).
7	P2	TB16	J3	Receive converter No. 1 output from rack A5.
21	P2	TB16	J3	Receive converter No. 1 output to switch panel (rack A2).
8	P2	TB16	J4	External oscillator signal to receive converter No. 1 (rack A5).
22	P2	TB16	J4	External oscillator signal from synthesizer (rack A3).
9	P2	TB21	J1	Output from receive converter No. 2.
23	P2	TB21	J1	Receive converter No. 2 output to switch panel (rack A2).
10	P2	TB21	J2	External oscillator signal to receive converter No. 2.
24	P2	TB21	J2	External oscillator signal from synthesizer (rack A3).
11	P2	TB21	J3	If. signal to if. amplifier No. 2.
25	P2	TB21	J3	If. signal from rack A2 (switch panel).
26	P2	TB21	J4	Combiner interconnect to if. amplifier No. 2 (V5A).
12	P2	TB21	J4	Combiner interconnect to if. amplifier No. 1 (V5A).

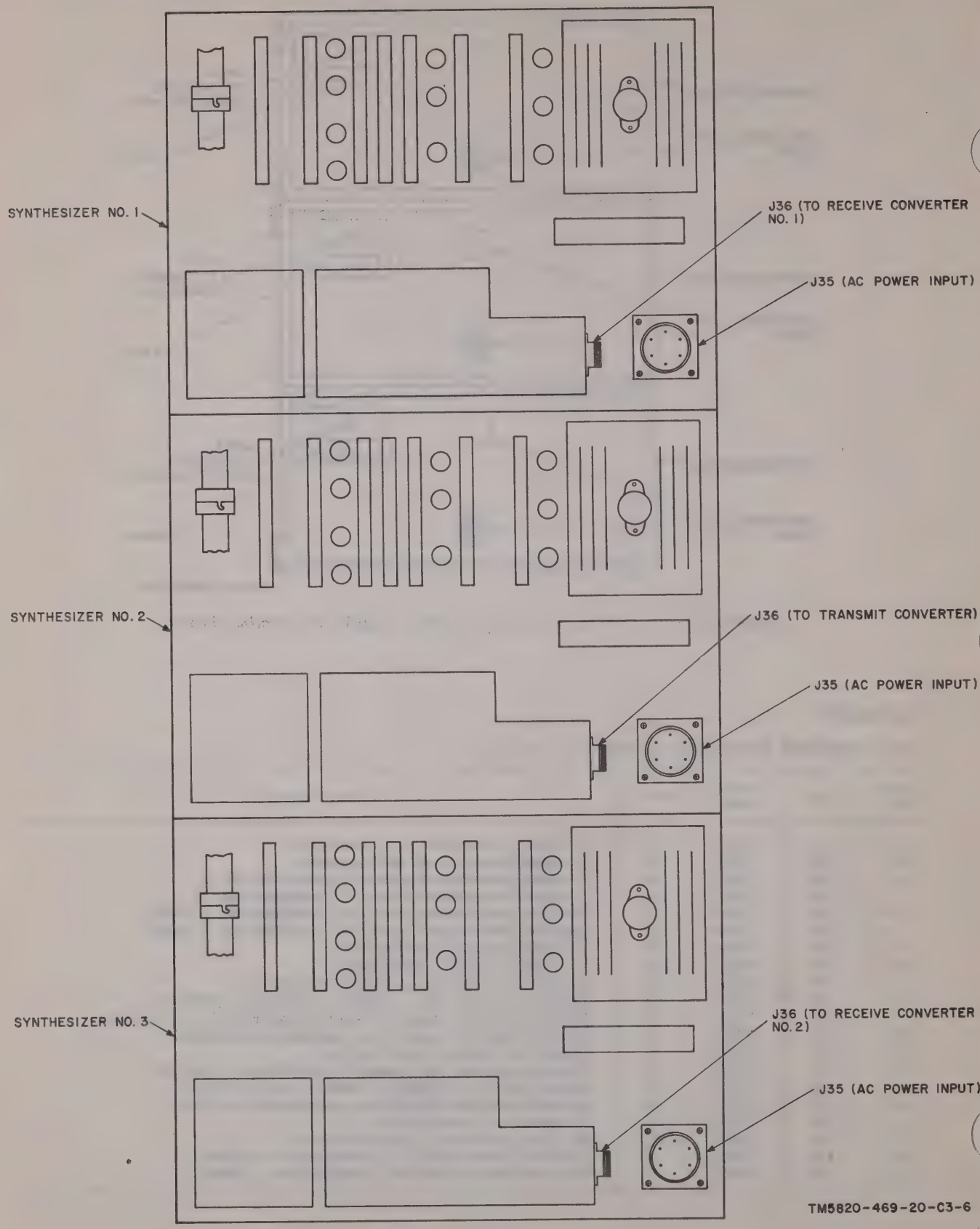

Figure 27.1. Electrical Frequency Synthesizer 0-1462A/TRC, rear view, location of jacks.

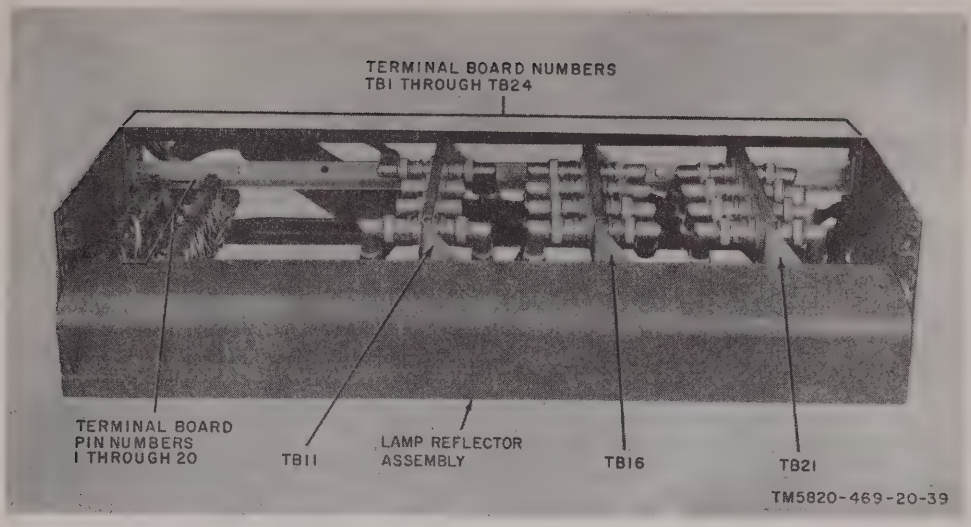

Figure 28. Terminal board, rack A4, location of terminal boards.

b. Receive Converter No. 2 (fig. 29 and 39 or 39.1).

Note. The rear views of both receive converters are identical.

Cable No.	Plug	Jack	Cable function
9	P1	J2[a]	Converter output to terminal panel.
10	P1	J3[a]	External oscillator signal from terminal panel.

a On some units, J2 has been labeled J16, and J3 has been labeled J17.

c. If. Amplifier No. 2 (fig. 30 and 39 or 39.1).

Note. The rear views of if. amplifiers No. 1 and No. 2 are identical.

Cable No.	Plug	Jack	Cable function
11	P1	J1	If. signal input from terminal panel.
26	P1	J2	Combiner (V5A) interconnect from/to terminal panel.
19	P1	J3	Combiner (V5B) interconnect from/to terminal panel.
6	P1	J4	If. output to terminal panel.
18	P1	J6	If. output interconnect from/to terminal panel.

39. Rack A5 and Power Amplifier Cabinet

a. Receive Converter No. 1 (fig. 29 and 39 or 39.1).

Note. On some units, J2 has been labeled J16, and J3 has been labeled J17.

Cable No.	Plug	Jack	Cable function
7	P1	J2	Output signal to switch panel (rack A2) through rack A4.
8	P1	J3	External oscillator input from rack A3 through rack A4.

b. If. Amplifier No. 1 (fig. 30 and 39 or 39.1).

Cable No.	Plug	Jack	Cable function
1	P1	J1	Input signal from switch panel (rack A2) by way of rack A4.
12	P1	J2	Combiner (V5A) interconnect from/to if. amplifier No. 2 (rack A4).
5	P1	J3	Combiner (V5B) interconnect from/to if. amplifier No. 2 (rack A4).
4	P1	J6	If. output interconnect from/to if. amplifier No. 2 (rack A5).

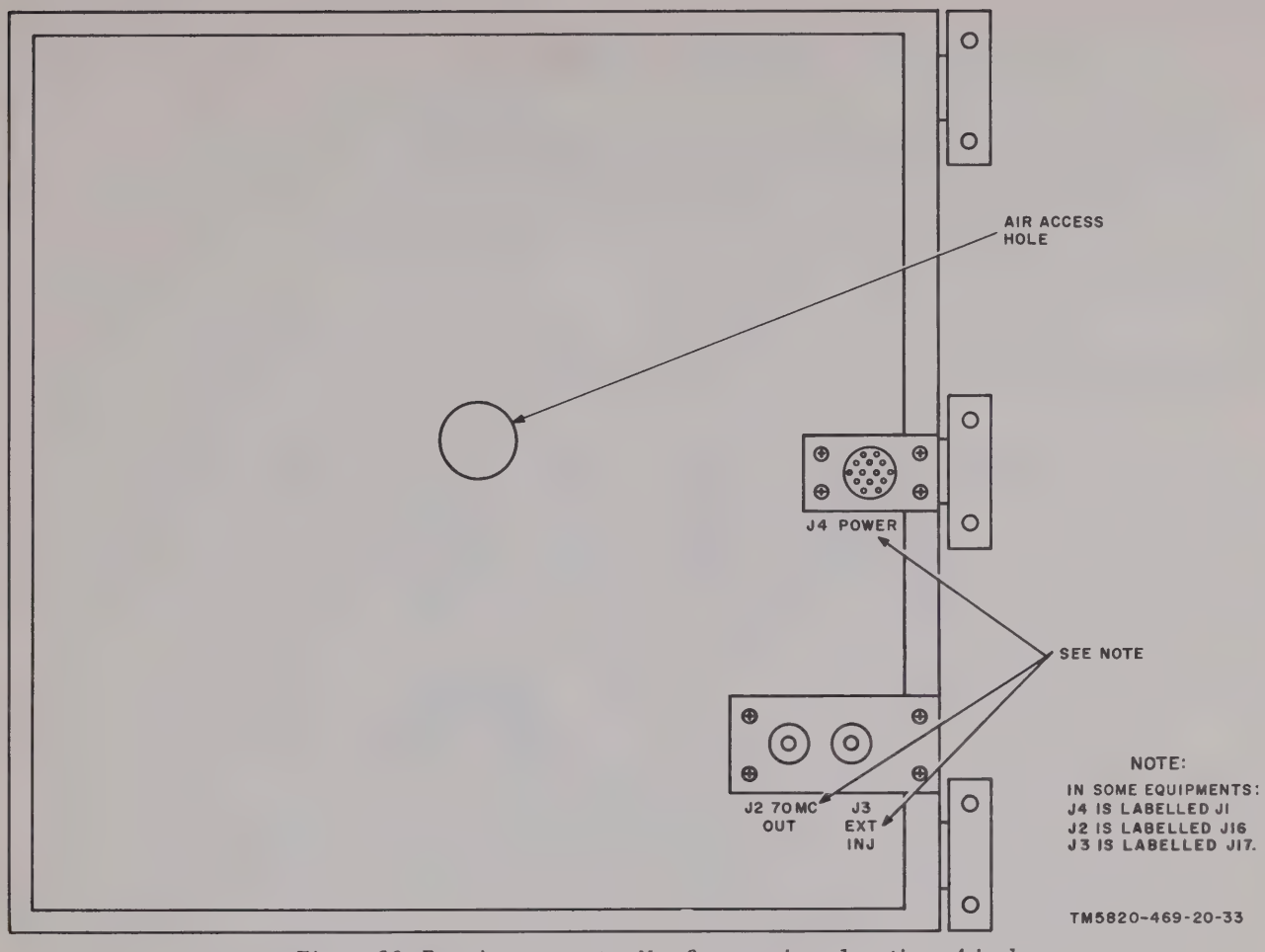

Figure 29. Receive converter No. 2, rear view, location of jacks.

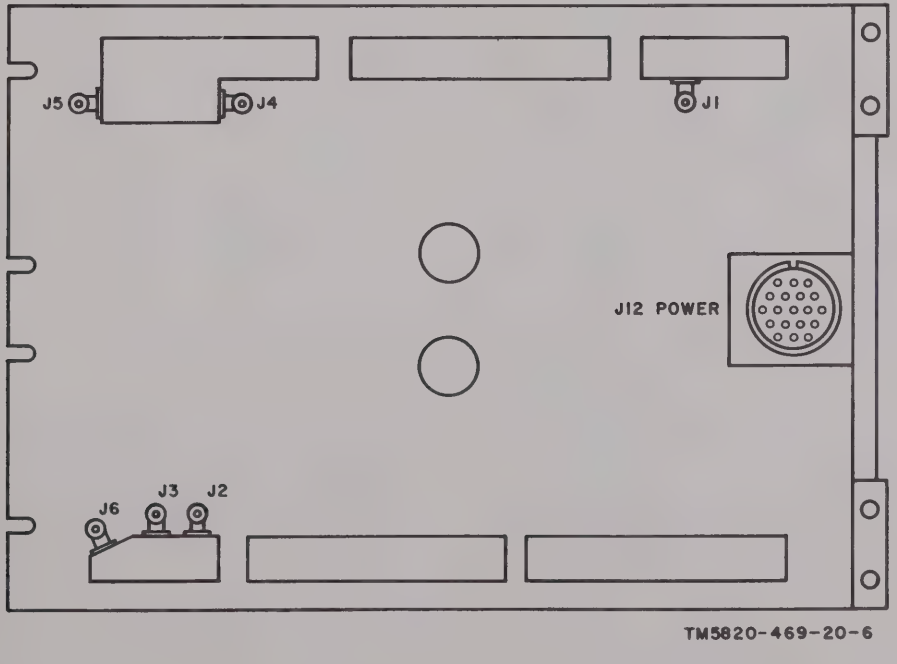

Figure 30. If. amplifier No. 1, rear view, location of jacks.

c. Power Amplifier Cabinet (fig. 31).

Cable No.	Plug	Jack	Cable function
64	P2	J3	Input from transmit converter in rack A1.

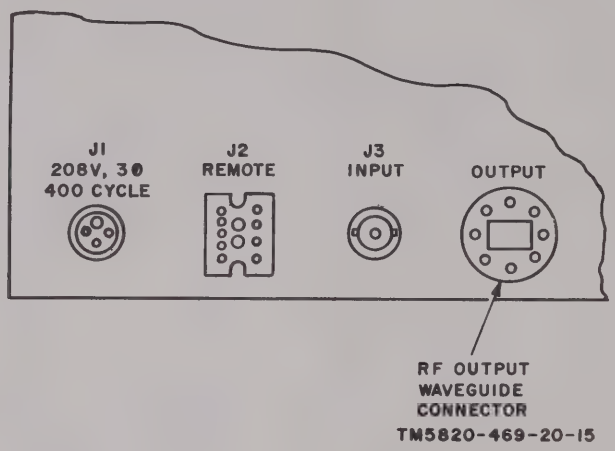

Figure 31. Power amplifier cabinet, location of jacks and connector.

CHAPTER 4

REPAIRS AND ADJUSTMENTS

Section I. REMOVAL AND REPLACEMENT PROCEDURES

40. General

a. With the exception of the power amplifier, which is mounted in a cabinet, all the electronic units of the AN/TRC-80 and AN/TRC-80A are rack mounted. For the locations of the various units within the racks, refer to figures 2 and 5 through 10.1 of TM 11-5820-469-10. All of the rack-mounted units, except the telegraph terminal, the teletypewriter switch panel, and the rack blowers, are mounted on hinges. This permits access to the rear of the chassis. All units in racks A1, A3, A4, and A5 have front protective covers which must be removed to obtain access to the front chassis components. The covers are secured by two push-type latches.

b. To obtain access to the rear chassis connectors on the hinge-mounted units, remove the protective covers and the rack-securing screws on the right side of the unit, and carefully swing the unit outward and to the left.

c. When chassis removal requires that wiring and cables be disconnected, all wires and cables should be adequately marked before they are disconnected from terminal boards or connectors. The removal and replacement procedures for the different types of equipment units are given in paragraphs 41 through 48.

41. Hinge-Mounted Chassis Removal

To remove a hinge-mounted chassis, proceed as follows:

a. Remove the front protective cover from the unit.

b. On the receive converter only, remove the attaching screws and disconnect the waveguide from the upper right-hand corner of the unit.

c. Remove the rack-securing screws at the right-hand edge of the unit.

d. Swing the unit completely out on its hinges.

e. Disconnect all external wiring or cables from the unit.

f. Support the weight of the unit so that no weight rests on the hinge.

g. While supporting the weight of the unit, remove the screws that secure the hinges to the rack.

h. Lift the unit carefully away from the rack. Be careful to avoid damage to the hinge-alignment pins.

42. Hinge-Mounted Chassis Replacement

To replace a hinge-mounted chassis, perform the following procedures:

a. Lift the repaired or replacement unit carefully into position on the rack, and engage the alignment pin of each hinge.

Caution: **Do not rest the weight of the unit on the hinges until the hinge-securing screws are tightened.**

b. Install the upper and lower hinge screws. (Do not tighten the screws.)

c. While supporting the unit, carefully swing it out to provide access to the inner hinge screws.

d. Install and tighten the remaining hinge screws, and tighten the screws installed in *b* above.

e. Reconnect the wiring and cables disconnected in the removal of the unit.

f. Swing the unit into the normal position and install the rack-securing screws.

g. Place the protective cover on the unit and secure it in place with the two fasteners.

43. Power Amplifier Drawer Removal and Replacement

To remove and replace the drawers of the power amplifier, follow the procedures given in *a* through *c* below.

Warning 1: **Remove all power to the power amplifier before removing the drawers.**

Warning 2: **At least two men are required to handle the power amplifier power supply drawer and the klystron drawer.**

a. Power Amplifier Control Panel Drawer Removal.

(1) Depress the red release buttons on the two drawer lock handles of the control panel.

(2) Rotate the two lock handles outward, to the horizontal position.

(3) Pull the drawer straight forward to the stops.

(4) Press the two stop latches on the sides of the two drawer slides and remove the drawer from the cabinet.

b. Power Amplifier Control Panel Drawer Replacement (fig. 32).

(1) Extend the drawer slides fully to their latch positions.

(2) Lift the control panel drawer to mate with the drawer slide.

(3) While supporting the weight of the drawer, press the two stop latches and push the drawer onto the slides.

(4) Close the drawer completely to engage the mating connector at the rear of the unit.

(5) Rotate the two drawer lock handles downward until they latch into place.

c. Power Amplifier Power Supply Drawer Removal (fig. 33).

(1) Press the red buttons on the two power supply drawer lock handles.

(2) Rotate the two lock handles outward, to the horizontal position.

(3) Pull the drawer straight forward to the stop.

Caution: **Do not attempt to remove the drawer from the cabinet before disconnecting the cables from J301 and J302. Be careful not to snag the cables against the drawer edge when removing the power supply drawer.**

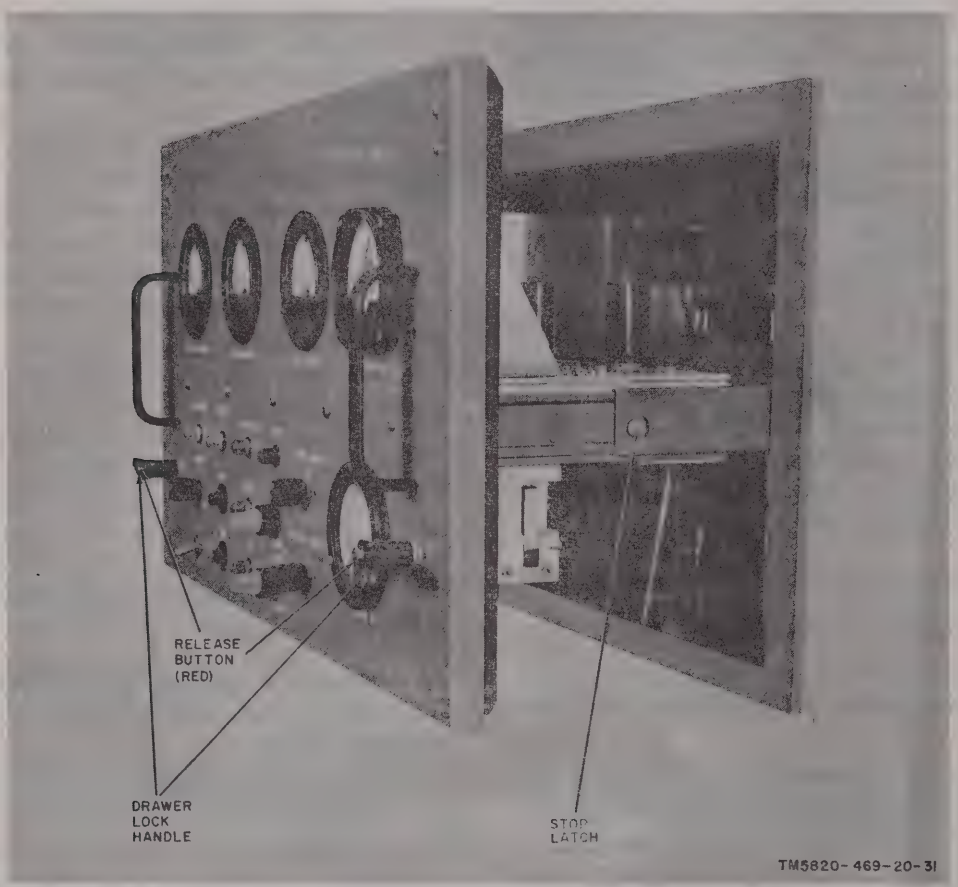

Figure 32. Power amplifier control panel, drawer removal details.

(4) Disconnect the cables from J301 and J302.

(5) Release the drawer stop latches at the sides of the drawer and remove the drawer from the cabinet.

d. Power Amplifier Power Supply Drawer Replacement (fig. 33).

(1) Slide the power supply drawer into the cabinet to the drawer stop latch.

(2) Release the latch and slide the drawer in far enough for the latch to operate.

(3) Connect the two cables from the klystron drawer to jacks J301 and J302.

(4) Slide the power supply drawer completely into the cabinet to mate with the connector at the rear of the drawer.

(5) Rotate the two drawer lockhandles downward until they latch into place.

e. Power Amplifier Klystron Drawer Removal (fig. 34).

(1) Remove the control panel drawer (*a* above).

(2) Pull the power supply drawer forward to the stops (*c*(1), (2), and (3) above).

(3) Disconnect the two cables from jacks J301 and J302 (fig. 33).

(4) Release the two quarter-turn screws that retain the access plate to the front panel of the klystron drawer, and remove the access plate.

(5) Use a screwdriver to relax the tension of the upper and lower band clamps on the fabric boot which connects the klystron unit to the metal blower adapter. Gently slide the fabric boot down.

(6) Remove the three coaxial cables from jacks J203, J204, and J205.

(7) Remove the eight waveguide flange screws that connect the E-bend waveguide section to the vertical section.

(8) Relax the tension on the small band clamp around the end of the plastic airhose. Remove the airhose from the air input connector.

(9) Rotate the two lock handles outward, to the horizontal position.

(10) Slowly and very carefully remove the drawer from the cabinet. *Be sure not to snag the two power supply cables against the rack frame cross member.*

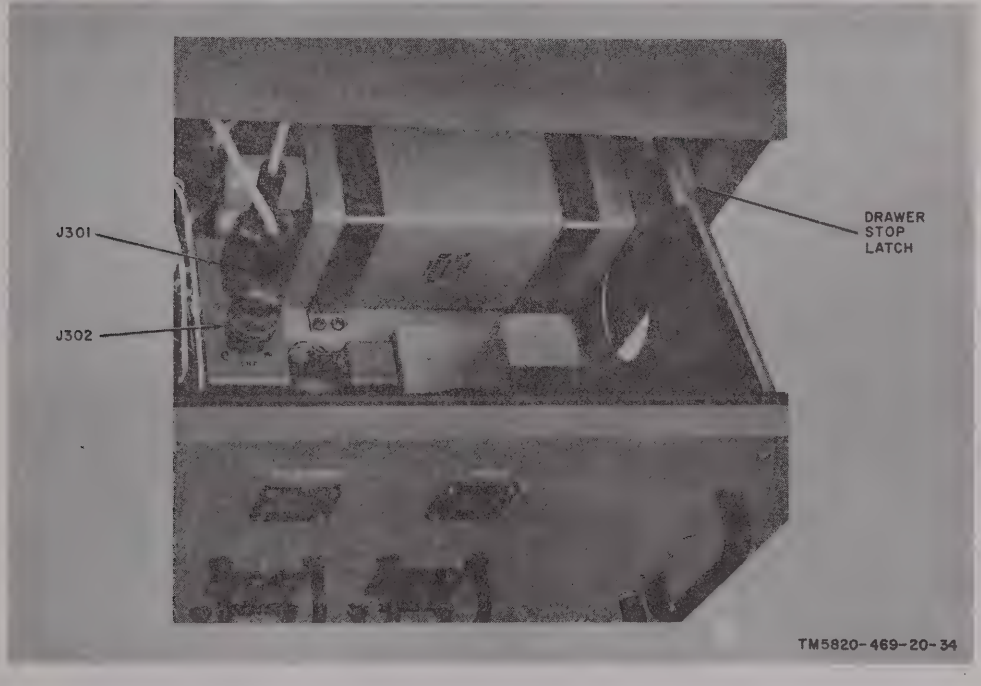

Figure 33. Power supply drawer, location of jacks and drawer stop latch.

f. Power Amplifier Klystron Drawer Replacement (fig. 34).

(1) Lift the klystron drawer into a position level with the cabinet shelf and drop the two power supply cables down into the power supply recess.

(2) Slide the drawer into the cabinet carefully so that the power supply cables do not become snagged.

(3) Rotate the two lock handles downward into the vertical position.

(4) Connect the power supply cables to jacks J301 and J302 (fig. 33) of the power supply drawer.

(5) Slide the power supply drawer fully into the cabinet.

(6) Rotate the two drawer lockhandles on

the power supply drawer downward until they latch into place.

(7) Connect the coaxial cables to jacks J202, J203, and J205 on the klystron drawer.

(8) Install the eight screws to secure the E-bend waveguide section to the vertical section.

(9) Attach the plastic airhose to the air input connector with the small band clamp.

(10) Connect the fabric boot from the klystron unit to the blower and tighten the two band clamps.

(11) Replace the access plate on the front panel of the klystron drawer and tighten the two quarter-turn screws.

(12) Replace the control panel drawer (*b* above).

44. Teletypewriter Removal and Replacement

The teletypewriter (fig. 5, TM 11-5820-469-10) is removed and replaced as follows:

a. Removal.

(1) Disconnect the ground leads from the front of the cover.

(2) Release the two latches at the sides of the cover.

(3) Lift the cover from the teletypewriter.

(4) Disconnect the teletypewriter electrical connections and unplug the power connector from the teletypewriter switch panel.

(5) Remove the nuts from the four mounting bolts that secure the teletypewriter to the shock mounts.

b. Replacement.

(1) Set the teletypewriter in place on the shock mounts.

(2) Secure the teletypewriter to the shock mounts with the four mounting bolts and nuts.

(3) Connect the teletypewriter electrical connections and connect the power plug to the teletypewriter switch panel.

(4) Replace the cover on the teletypewriter and secure the two latches.

(5) Connect the ground leads to the front of the cover.

45. Removal and Replacement of Teletypewriter Switch Panel and TH-5A/TG or TH-22/TG

Note. The removal and replacement procedures for the TH-22/TG are the same as for the TH-5A/TG. When the TH-22/TG is employed, it is rack-mounted in rack A2 in the same location as the TH-5A/TG. Refer to figures 5 and 26.1, TM 11-5820-469-10.

The teletypewriter switch panel and the TH-5A/TG (fig. 5, TM 11-5820-469-10) are mounted on the same shelf on rack A2. The two units must be removed at the same time.

a. Removal.

(1) Remove the TH-5A/TG power connector from the right-hand 120V 400 CPS (fig. 25, TM 11-5820-469-10) outlet of the teletypewriter switch panel.

(2) Remove the teletypewriter power connector from the left-hand (twist-lock) 120V 400 CPS outlet of the teletypewriter switch panel.

(3) Disconnect the two cables from cable connectors J1 and J4 on top of the teletypewriter switch panel.

(4) Unfasten the two cable clamps that secure the cables in front of the TH-5A/TG.

(5) Remove the two wires from the 4W-R terminals on the front panel of the TH-5A/TG (fig. 26, TM 11-5820-469-10).

Note. Be sure that these wires are adequately marked.

(6) Remove the two wires from the 4W-S terminals on the front panel of the telegraph terminal.

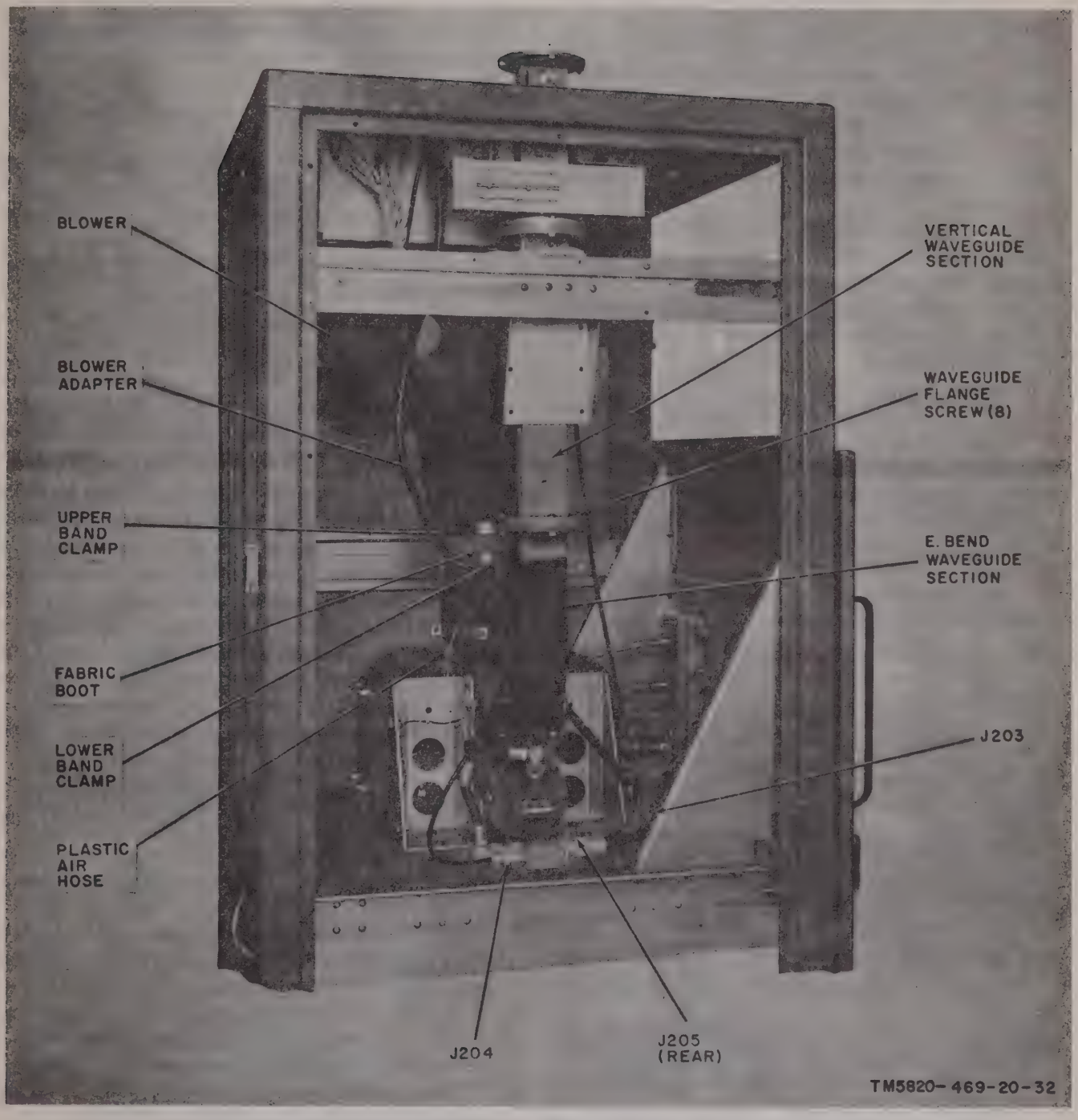

Figure 34. Klystron drawer, side view, drawer removal detail.

Note. Be sure that these wires are adequately marked.

(7) Remove plug P9 from the SEND jack on the TH-5A/TG.

(8) Remove plug P10 from the REC. jack on the TH-5A/TG.

(9) While supporting the weight of the shelf, remove the four rack-mounting screws that secure the shelf to the rack.

(10) Remove the shelf, with the TH-5A/TG and the teletypewriter switch panel attached, and place it bottom up to provide access to the mounting screws.

(11) Remove the six teletypewriter switch panel mounting screws; remove the unit and set it aside for repair or replacement.

(12) Remove the four TH-5A/TG mounting screws; remove the unit and set it aside for repair or replacement.

b. Replacement.

(1) Secure the TH-5A/TG to the righthand

Note. The front edge of the shelf is the edge toward which the mounting brackets slope.

side of the shelf with the four mounting screws.

(2) Secure the teletypewriter switch panel to the left-hand side of the shelf with the six mounting screws.

(3) Lift the shelf, with the two units attached, into position on rack A2, and secure it in place with the four rack-mounting screws.

(4) Replace the cables and wires removed in *a* above.

46. Rack Blower Removal and Replacement
(fig. 35)

Note. In rack A3 of the AN/TRC-80A, the blower unit is deleted.

a. Removal. Each of the three rack blowers (fig. 6, 7, and 9, TM 11-5820-469-10) is removed as follows:

(1) Loosen the four screw-type fasteners and remove the air filter unit.

Note. The fuse indicators (F1, F2, and F3) are now accessible.

(2) Swing out the unit directly above the blower (para 41). In rack A3, remove the four storage box mounting screws, and remove the storage box.

(3) Remove power connector J1 from the power receptacle.

(4) Remove the eight screws that secure the duct assembly to the rack plenum.

(5) Remove the four screws that secure the blower assembly to the rack.

(6) Remove the blower assembly from the rack.

b. Replacement. Each of the rack blowers is replaced as follows:

(1) Place the blower into position on the rack and secure it with the four mounting screws.

(2) Secure the duct assembly to the rack plenum with the eight screws.

(3) Connect power connector J1 to the power receptacle.

(4) Mount the air filter unit in place on the housing and secure the four screw-type fasteners.

(5) Secure the unit removed in *a*(2) above.

47. Air-Conditioning Unit Removal and Replacement
(fig. 36)

Refer to the instruction book issued with the air conditioner for the detailed repair procedures. The air-conditioning units are removed for maintenance or repair and replaced as instructed below:

Warning: **Turn off all power before removing or replacing any unit within the air conditioner.**

a. Condenser Unit Removal. Two condenser units are installed on the inside of the louvered door on the right side of the shelter. Access to the condenser units for maintenance is obtained by lowering the door, which is hinged along the bottom and is held in a horizontal position by two support cables.

(1) Unscrew the four captive screws from each side of the air conditioner access door.

(2) There are seven captive screws along the top of the door. Unscrew all except the center screw.

Caution: **Two men are required to handle the heavy door.**

(3) Carefully unscrew the center screw, while supporting the weight of the door and condenser units.

(4) Slowly lower the door.

(5) Remove the power and control cables, and the auxiliary time delay cable.

(6) Remove the ground strap by removing the securing screw.

Caution: **The sections of the refrigerant lines are under pressure and are equipped with automatic sealing devices to retain the refrigerant when the lines are disconnected. When a line connection**

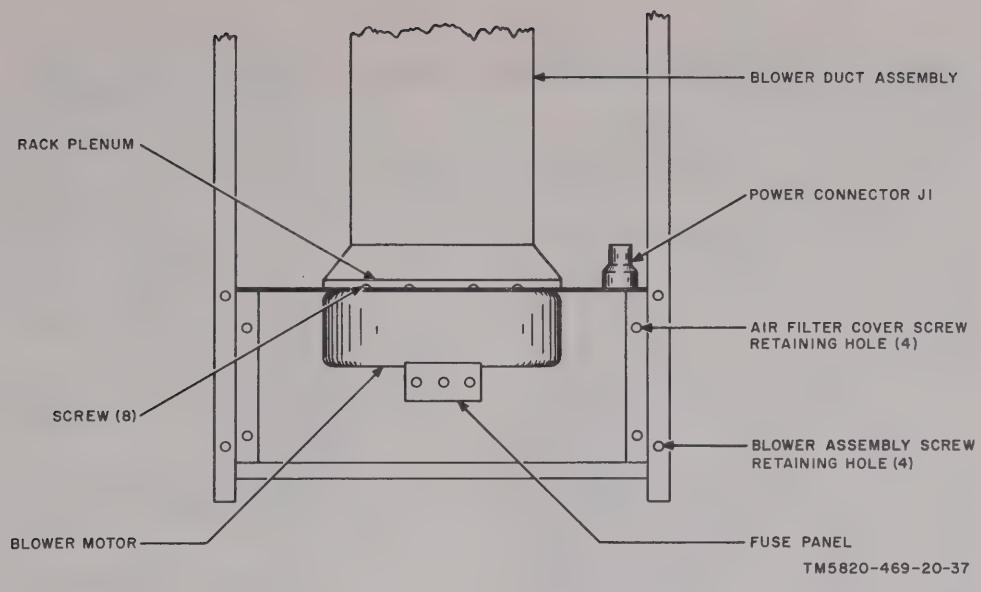

Figure 35. Blower removal detail.

has been loosened, it must be quickly and completely disconnected to avoid excessive loss of refrigerant.

(7) Use an open-end wrench to hold each refrigerant line fitting on the unit so that it cannot turn.

Caution: DO NOT allow the fitting on the unit to turn.

(8) With another open-end wrench, loosen each line coupling and quickly disconnect the liquid and suction line hoses.

Caution: Avoid kinking or twisting the hose.

(9) Remove the four bolts that secure the unit to the shock mounts; take care not to lose the eight snubbing washers that are mounted on both sides of each shock mount.

(10) Remove the compressor unit.

(11) If the condenser is to be shipped or stored indefinitely, close the receiver valve (located behind the air intake screen).

b. Condenser Unit Replacement.

(1) Place the condenser unit in place on the air conditioner access door shock mounts.

(2) Secure the condenser to the shock mounts with the four mounting bolts.

Caution: The sections of refrigerant lines are under pressure and are equipped with automatic sealing devices to retain the refrigerant when the lines are disconnected. When a line connection is started, it must be connected quickly to avoid excessive loss of refrigerant.

(3) Connect the refrigerant (suction) line stamped S on the flats of the hexagonal fitting to the fitting on the condenser unit marked S. Use two wrenches, one to hold the fitting on the unit stationary, and the other to snug up the coupling to approximately 35 foot-pounds of torque. *Do not allow the fitting on the unit to turn. Avoid kinking or twisting the hose.*

(4) Connect the refrigerant (liquid) line stamped D on the flats of the hexagonal fitting to the fitting on the condenser unit marked D. Follow the same procedure as detailed in (3) above).

(5) If the condenser unit is a new replacement, or if the refrigerant has been turned off, open the receiver valve. Remove the valve stem cap to expose the stem. Turn this stem counterclockwise as far as it will go and replace and tighten the cap. A slight hissing sound may

be heard during this process as the refrigerant is released from the tank into the system.

(6) Connect the heavier electrical cable (containing 14 wires) to the receptacle marked L.

(7) Connect the three-wire cable to the time-delay connector.

(8) Connect the ground strap to the unit.

(9) Connect the power cable (four-wire) to the receptacle marked P.

Caution: The wire marked 1 must go to phase A; wire 2 to phase B; wire 3 to phase C; and wire 4 to neutral. INCORRECT PHASING WILL RESULT IN IMPROPER MOTOR ROTATION. OPERATION IN REVERSE ROTATION FOR MORE THAN 30 SECONDS WILL RESULT IN LUBRICATION FAILURE AND BEARING BURNOUT IN THE COMPRESSOR. CHECK THE ROTATION AS FOLLOWS:

(a) Set control switch SW-2 (fig. 34, TM 11-5820-469-10) to VENT, and SW-1 to ON.

(b) Observe the rotation of the evaporator fan motor (which should be the only fan operating at this seting). The rotation should be COUNTERCLOCKWISE WHEN LOOKING DOWN INTO THE EVAPORATOR SECTION. Doublecheck by noting that air is being discharged *out* of the deflector grilles in the evaporator section. If the rotation is improper, shut off the power and interchange any two of the power leads. (Do not disturb the neutral lead.)

(10) Check the operation as follows:

(a) Place control switch SW-2 in the VENT position.

(b) Place SW-1 to ON. The evaporator fan should run.

(c) Turn SW-3 counterclockwise as far as it will go. Place SW-2 in the COOL position. The evaporator fan should be the only fan runing.

(d) Turn SW-3 clockwise. The condenser fan and compressor should start. Check the condenser fan rotation; it should be clockwise when seen through the rear of the condenser section. Observe the sight glass; it should be clear and free of bubbles after a few minutes of operation. Higher echelon maintenance is required if the above indications are not obtained.

(11) Turn off the power. Close the door and secure it with the 15 captive screws.

c. Evaporator Unit Removal.

(1) Remove the power and the control cable.

Caution: The sections of refrigerant lines are under pressure and are equipped with automatic sealing devices to retain the refrigerant when the lines are disconnected. When a line connection is loosened, it must be completely disconnected quickly to avoid excessive loss of refrigerant. When removing the line fitting, do not allow the fitting on the unit to turn.

(2) Use an open-end wrench to hold the refrigerant line fitting on the unit so that it cannot turn.

(3) With another open-end wrench, loosen the line coupling and quickly disconnect the line.

(4) Remove the four nuts from the shock mount studs, and remove the four outer snubbing washers.

(5) Remove the evaporator unit and set it aside for repair or replacement.

d. Evaporator Unit Replacement.

(1) Place the evaporator unit into position on the shock mounts, replace the snubbing washers on the studs, and secure with four nuts.

Caution: The sections of refrigerant lines are under pressure and are equipped with automatic sealing devices to retain the refrigerant when the lines are disconnected. When a line connection is started, it must be connected quickly to avoid excessive loss of refrigerant.

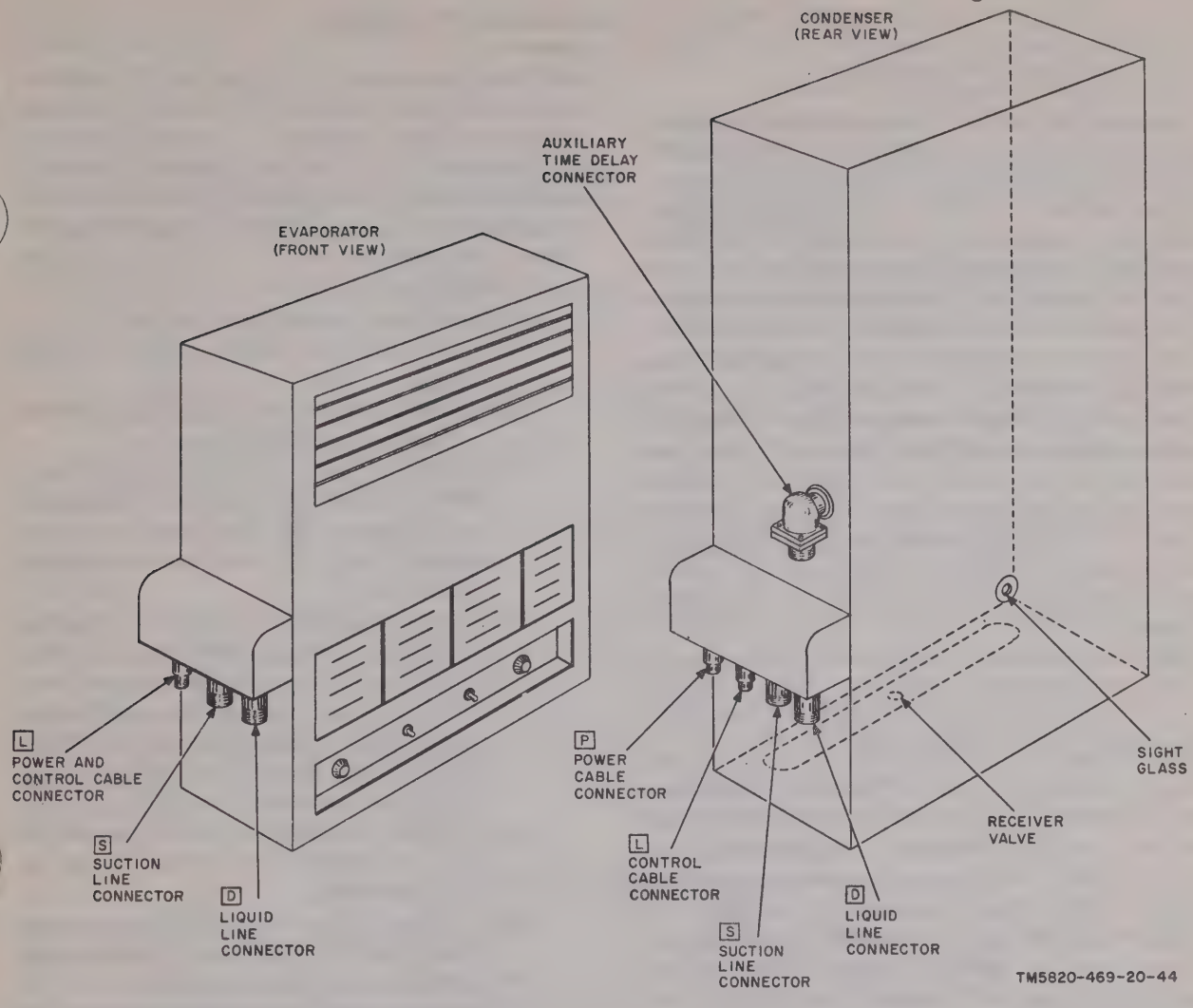

Figure 36. Air conditioner evaporator and condenser units, location of connectors.

(2) Connect the refrigerant line stamped S on the flats of the hexagonal fitting to the fitting on the evaporator unit marked S. Use two wrenches, one to hold the fitting on the unit stationary, and the other to snug up the coupling to approximately 35 foot-pounds of torque. *Do not allow the fitting on the unit to turn. Avoid kinking or twisting the hose.*

(3) Connect the refrigerant line stamped D on the flats of the hexagonal fitting to the fitting on the evaporator unit marked D. Follow the same procedure as detailed in (2) above.

(4) Connect the 14-wire electrical cable to the receptacle marked L.

48. Removal and Replacement of Components in Antenna AS-1270/TRC-80

Most of the components within the antenna assembly are readily accessible and easily replaced. Removal of heavy mechanical components and procedures that require special tools and equipment are beyond the scope of organizational maintenance personnel. Refer to paragraph 53 for the antenna patching procedures.

Note: The antenna platform must be raised prior to removing or replacing any component within the antenna assembly. Refer to TM 11-5820-469-10 for antenna erection.

Section II. TUBE TESTING AND REPLACEMENT

49. Tube-Testing Procedures

When the AN/TRC-80 fails to operate properly, use the sectionalizing procedures in paragraphs 16 through 20 to sectionalize the defect to an equipment group, and the localizing procedures in paragraphs 21 through 33 to locate the defective unit or assembly. Perform the corrective actions for the abnormal indications noted and, where tube failure is suspected, use the applicable procedure below to check the tubes. With the expection of tubes V1 through V4 (para 50) in the multiplier assembly of the receive and transmit coverters, traveling wave tube V9, and klystron tube V201, all tubes are readily accessible and easily replaced. Remove all power from the equipment before removing the tubes.

Note: Klystron tube V201 in the klystron drawer of the power amplifier and traveling wave tube V9 in the transmit converter must be replaced by higher category maintenance personnel.

a. Tube Tester Method. Remove and test one tube at a time. Discard a tube only if its defect is obvious or if the tube tester shows it to be defective. Immediately discard tubes that are shorted or contain heater-to-cathode leakage. Do not discard a tube that tests at or near its minimum test limit on the tube tester. Replace the original tube, or insert a new one if required, before testing the next one.

b. Tube Substitution Method. Replace a suspected tube with a new tube. If the AN/TRC-80 still fails to operate properly, remove the new tube and return the original tube to its socket. Repeat this procedure with each original tube until the radio set becomes operative or until all suspected tubes have been tested and the need for higher category repair is indicated.

50. Multiplier Assembly Tube Replacement

Note: This paragraph applies to Receive Converter AM-3302/TRC-80 and Transmit Converter AM-3303/TRC only.

a. General. Identical multiplier assembly subchassis (fig. 17) are contained in the transmit and receive converter units. The location of the multiplier assembly in the receive converter unit is illustrated in figure 11 and 19. The location of the multiplier assembly in the transmit converter unit is illustrated in figure 16. The multiplier assembly must be removed from the converter main frame for access to tubes V1 through V4. The multiplier assembly removal and replacement procedures are covered in *b* and *c* below. The replacement procedures for V1 through V4 are covered in *d* and *e* below.

b. Multiplier Assembly Removal.

(1) Turn off the power to the equipment.
(2) Remove the front protective cover from the converter unit.
(3) Remove the coaxial connectors from jacks J1 and J3 (transmit converter, fig. 16; receive converter, fig. 19) on the multiplier assembly.
(4) If the multiplier assembly is being removed from the receiver converter unit, remove the plugs from jacks J9 and J10. If the multiplier assembly is being removed from the transmit converter, remove the plugs from jacks J3 and J4.
(5) Loosen the four captive screws on the multiplier assembly (one on each corner).
(6) Loosen the two captive screws from the tripler cavity appendage of the multiplier assembly.
(7) Remove the multiplier unit from the converter frame.

c. Multiplier Assembly Replacement.

(1) Replace the multiplier assembly on the converter chassis and secure it with the six captive screws.
(2) Replace the plugs into the two chassis jacks (J3 and J4 on transmit converter, J9 and J10 on receiver converter). Observe the matching color codes and match the plug body color with the jack tip color.
(3) Replace the connectors on jacks J1 and J3 on the multipler assembly.
(4) Replace the front protective cover on the converter unit.

d. Tubes V1, V2, and V3 Replacement Procedures (fig. 17).

(1) Remove the 13 screws from the

bottom plate, and remove the bottom plate from the multiplier unit.

(2) With a pair of long-nosed pliers, gently slide the filament connector (small end) from the tube.

(3) Disengage the tube from the spring slips and remove it by pulling outward from the clips.

(4) Engage the replacement tube into the spring clips.

(5) With a pair of long-nosed pliers, gently attach the filament connector into the recess at the end of the tube.

(6) Replace the bottom plate and secure it with the 13 screws.

(7) Replace the multiplier unit (*c* above).

e. Tube V4 Replacement Procedure.

(1) Remove the 13 screws from the bottom plate of the multiplier unit and remove the bottom plate.

(2) Remove the four screws and washers that secure tripler cavity Z1 (fig. 17) to the multiplier unit. Gently remove the tripler cavity from the multiplier unit; use a slight twisting motion.

(3) Remove the four screws from the retaining plate. Remove the retaining plate and the thrust washer.

(4) With a pair of long-nosed pliers, carefully slide the filament connector from the tube.

Caution: **Be sure not to disturb the component positions during tube replacement.**

(5) Hold the end clip securely in position, and slide the tube through the end of the multiplier assembly.

(6) Slide the replacement tube through the end of the multiplier assembly and, while holding the end clip securely in position, engage the tube into the clip.

(7) With a pair of long-nosed pliers, gently attach the filament connector to the tube.

(8) Replace the thrust washer and the retaining plate.

(9) Secure the retaining plate with the four screws removed in (3) above.

(10) Gently replace tripler cavity Z1 on the multiplier assembly; use a slight twisting motion.

(11) Secure the tripler cavity to the multiplier unit with the four screws removed in (2) above.

(12) Replace the bottom plate and secure it with the 13 screws.

(13) Replace the multiplier unit (*c* above).

Section III. ADJUSTMENT AND REPAIR PROCEDURES

51. Liftscrew Chain Adjustment

An adjustable idler sprocket is contained in the antenna compartment. The idler sprocket may be adjusted to tighten the liftscrew chain. The liftscrew chain is sufficiently taut when there is no visible sag between sprockets. The chain is inspected at 30-day intervals (para 6, sequence No. 9). If any sag is noted, tighten the chain as follows:

a. For equipments procured on Order No. 4255-PP-61, perform the procedures given in paragraph 11*b*(1) through (4). For equipments procured on Order No. 15058-PP-62, perform the procedures in paragraph 11*b*.1(1) through (4).

b. Inspect the liftscrew chain. If the liftscrew chain has visible sag, continue with the procedures given in c through *f* below; if it has no visible sag, proceed directly to *f* below.

c. Loosen the four studs on the movable idler sprocket plate so that the plate can barely be moved.

Caution: **Do not overtighten. The operation of the chain does not depend on tension.**

d. Move the plate in a direction to tighten the chain until no sag is visible.

e. Tighten the four studs.

f. For equipments procured in Order No. 4255-PP-61, perform the procedures given in paragraph 11*b*(9). For equipments procured on Order No. 15058-PP-62, perform the procedures given in paragraph 11*b*.1(6).

51.1 Platform Brake Adjustment (fig. 4.1)

a. Disengage the coarse azimuth locking pin (fig. 3).

b. Depress the BRAKE pedal to lock the azimuth platform and prevent manual rotation of the platform.

c. If the braking action is inadequate, proceed as follows:

(1) Obtain access to the antenna compartment.

Note. For equipments procured on Order No. 4255-PP-61, refer to paragraph 11*b*. For equipments procured on Order No. 15058-PP-62, refer to paragraph 11*b*.1.

(2) Adjust the brake adjusting rod (fig. 4.1) until sufficient braking is obtained.

(3) On equipments procured on Order No. 4255-PP-61, replace the antenna compartment hatch covers; swing the hinged units on rack A2 back to their normal positions, and replace the rack-securing screws.

(4) On equipments procured on Order No. 15058-PP-62, replace and secure the antenna compartment access plate and close the air conditioner door.

52. Antenna Platform Elevation Liftscrew Adjustment

(fig. 1)

If it becomes difficult or impossible to lock all antenna platform locking handles in either the elevated or lowered position, adjust the elevation liftscrew. The procedure is as follows:

a. If the antenna is in the stowed condition, elevate the platform and lock at least three of the antenna platform locking handles (fig. 3).

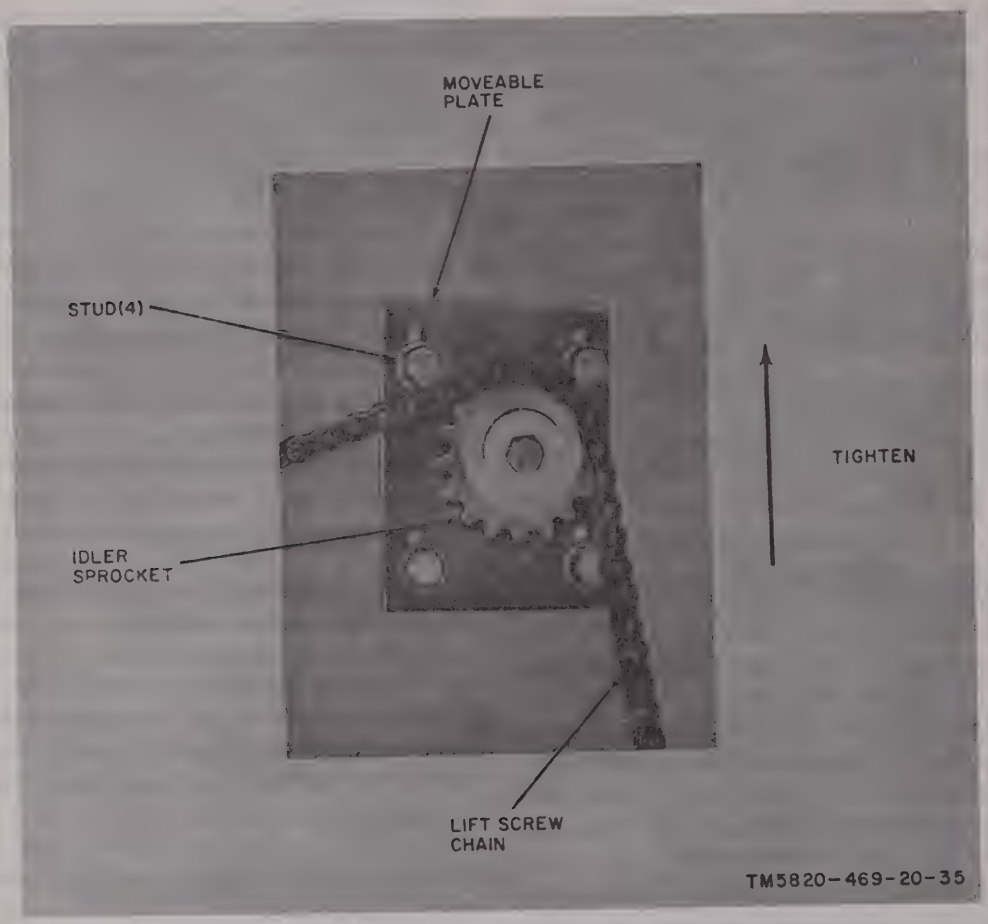

Figure 37. Liftscrew chain adjustment details.

(Refer to TM 11-5820-469-10 for antenna erection details.)

b. For equipments procured on Order No. 4255-PP-61, perform the procedures given in paragraph 11*b*(1) through (4). For equipments procured on Order No. 15058-PP-62, perform the procedures in paragraph 11*b*.1(1) through (4).

c. Locate the chain joint (master link). Tie a wire noose (stranded wire) between the links on either side of the master link.

d. Remove the master link from the chain, and lift the chain away from each sprocket.

e. If any of the platform locking handles were not locked, use the crank (fig. 37, TM 11-5820-469-10) and crank the elevation liftscrew for the unlocked locking handle until it can be locked. Leave all four handles locked.

f. Beginning with the left-hand rear and right-hand rear screws (opposite the personnel door), crank each liftscrew (while locked) to determine

the upper and the lower limits of its travel. By observing the number of sprocket teeth passing by a given point from the upper to the lower limits, determine the midpoint and set the liftscrew at that point.

g. Without turning the liftscrews, wrap the chain around these sprockets. Leave as little chain slack as possible.

h. Repeat the adjustment for the left-hand front and right-hand front liftscrews. Again wrap the chain around the sprockets, leaving as little slack as possible.

i. Reassemble the chain by inserting the master link; use the stranded wire noose to pull the ends together. If necessary, loosen the idler sprocket (para 51) to accomplish this. Remove the wire noose.

j. Tighten the idler sprocket if necessary (para 51). Unlock all four antenna platform locking handles. Lower the antenna platform, and check the chain for the proper amount of slack. Elevate the antenna again. All locking handles should now lock easily.

k. Lower the antenna, and lock it in the lowered position. The locking handles should lock easily in this position as well as in the elevated position. If the handles do not lock, determine which liftscrew is binding. Refer to the appropriate procedure (*f* or *h* above), and readjust that liftscrew, turning it approximately four teeth at a time from the midpoint until a compromise is reached whereby the platform may be locked equally easily in either the lowered or elevated position.

l. For equipments procured on Order No. 4255-PP-61, perform the procedures given in paragraph 11*b*(9). For equipments procured on Order No. 15058-PP-62, perform the procedures given in paragraph 11*b*.1(6).

53. Antenna Fabric Patching

a. General. During inspection of the antenna, if a tear or air leak is discovered in the antenna bag, use the material furnished in the antenna repair kit to repair it. If repair is to be made to the cover side, apply the patch to the inside surface (black surface of the material). If repair is to be made to the reflector side, apply the patch to the outside surface after removing the paint. The patch kit consists of the following items:

(1) Two 6-inch by 72-inch pieces of patching material.

Warning: **The items listed in (2), (3), and (7) are RED LABEL items and should not be shipped by air.**

(2) Four 1/2-pint cans of adhesive.

(3) Four bottles of adhesive accelerator (for the adhesive).

(4) One 18-inch by 18-inch piece of reflective material.

(5) One 1/2-pint can of Hypalon olive drab paint.

(6) Two 2-inch paint brushes.

(7) Two 1-pint cans of Toluol cleaner.

(8) Cleaning cloths.

b. Preparation of Cement.

Warning: **Materials used for antenna repair are flammable. Keep them away from heat or flame.**

(1) Add the entire contents of one bottle of accelerator to a 1/2-pint can of adhesive.

(2) Thoroughly mix the adhesive and accelerator.

Caution: **Cement must be used within 8 hours after mixing. Discard any cement that has been standing longer than 8 hours.**

c. Preparation of Surface.

(1) Lay out the area to be patched on a flat surface.

(2) If the patch is to be placed on the inside surface of the cover side, clean the area to a distance of 2-1/2 inches encircling the defect, with a cloth dampened with Toluol cleaner.

(3) If the patch is to be placed on the outside surface of the reflective side, clean the area to a distance of 2-1/2 inches encircling the defect using Toluol cleaner and a bristle brush or rough cloth to remove all paint.

d. Preparing Material. In patching a defect, the warp direction marked on the patch must correspond to the warp direction of the antenna material. The warp direction of the antenna material is in the radial (long) direction of the panels.

(1) Cut a piece of patching material large enough to cover the defect, overlapping at least 2 inches on all sides.

(2) Clean the contact surface of the patch with a cloth saturated in Toluol cleaner.

e. Patching Defect.

(1) Apply a coat of the mixed cement to the patch and antenna surfaces, and allow it to dry

until almost tack free (10 to 20 minutes, depending on humidity).

(2) Apply a second coat of cement to each surface, and allow it to dry until tacky (when the cement does not pick off if touched with the knuckle).

(3) Apply the patch, pressing down carefully from one end to avoid entrapment of air.

(4) Rub down thoroughly with a dry cloth to insure contact.

(5) After the patch has cured for 24 hours, repaint the exterior surface with olive drab paint.

53.1 Shelter Patching

a. General. Punctures in the shelter skin can be repaired with the shelter repair kit. The repair kit contains the following items:

(1) Twenty-one aluminum panels.
(2) Shredded foam insulation.
(3) Foam insulation pads.

Warning: **The materials listed in (4) and (7) below are RED LABEL items and should not be shipped by air.**

(4) Adhesive.
(5) Sheet metal screws.
(6) Paint.
(7) Thinner.
(8) Paint brushes.
(9) Mixing sticks.
(10) Screwdriver.
(11) Awl.
(12) Masking tape.
(13) Cheesecloth.
(14) Emery cloth.

b. Patching Instructions.

Warning: **The adhesive and thinner used for shelter repair are flammable. Keep them away from heat or flame.**

(1) Select an aluminum panel that will overlap the punctured area.

(2) Place the selected panel over the punctured area and, with the awl, scribe the patch outline on the shelter skin.

(3) Temporarily secure the new panel in place with masking tape.

(4) Use the awl to puncture four holes in the shelter skin, with the corner-located holes in the panel as guides. The holes must not exceed 1/6 inch in diameter.

(5) Remove the new panel.

(6) Thoroughly clean the paint from the scribed area with emery cloth, and wipe off the residue with the cheesecloth.

(7) Fill the cavity in the shelter skin with shredded foam.

(8) Remove the rubber separator from the two-component adhesive package. Mix the two components thoroughly by kneading the plastic package.

(9) Apply the mixed adhesive to the cleaned area of the shelter skin and to the back of the new panel, with a wooden mixing stick.

(10) Place the patch in position, and secure it with sheet metal screws in each corner.

(11) With the remaining holes in the panel as guides, use the awl to punch holes through the shelter skin. The holes must not exceed 1/16 inch in diameter.

(12) Finish securing the panel with the sheet metal screws.

(13) Clean the excess adhesive from the edges of the patch and from the heads of the screws.

(14) Paint the patch with olive drab paint. Be sure to cover the screwheads.

CHAPTER 5
BLOCK AND DIAGRAM FUNCTIONING

54. General
(fig. 38 or 38.1)

Note. The block diagram functioning of the AN/TRC-80A is similar to that of the AN/TRC-80.

The block diagram will aid the organizational repairman in the understanding of signal flow and the relationship of the equipment groups within the AN/TRC-80. The direct current (dc) power supplies, switch panel, engine generator, and air conditioner units have been omitted from the block diagram. Outgoing radio signals to a distant AN/TRC-80 may be originated by voice call by the local operator or from the operator's Teletypewriter Set TT-335/TG. Outgoing radio signals may also be originated at the programmer test station (pts). Signals originating from the pts are routed through the power and signal entry panel and Communication Control Panel SB-1564/TRC-80 to the radio circuits of the AN/TRC-80. Incoming radio signals from the distant AN/TRC-80 are routed through the radio circuits of the AN/TRC-80 to the local operator's teletypewriter, or through the power and signal entry panel to the pts. The local operator may also establish voice or teletypewriter communication with the facilities illustrated in figure 38. The local operator or the pts can take control of the radio circuits of the AN/TRC-80; the other remote facilities, consisting of the army area net and vehicle radio, can establish voice or teletypewriter communication with the local AN/TRC-80 operator but cannot take control of the radio facilities. Refer to TM 11-5820-469-10 for the details of system application.

55. Transmission Path
(fig. 38 and 38.1)

a. Input Circuits. Speech and teletypewriter signals from the local operating position or from the pts facility (through the power and signal entry panel) are applied to Communication Control Panel SB-1564/TRC-80 (control panel). Signals originating at the local teletypewriter are converted from dc teletypewriter signals to voice frequency (vf) signals (1,225 cycles per second (cps) and 1,325 cps) by Telegraph Terminal TH-5A/TG. Signals originating at pts are in vf form and are converted by the switching circuits from two-wire vf teletypewriter signals to four-wire line operation.

b. Demultiplexer-Multiplexer TD-550/TRC-80. With the control panel set up for radio communication, the speech and vf teletypewriter signals are routed to Demultiplexer-Multiplexer TD-550/TRC-80 (multiplexer) where the frequency of the teletypewriter vf signals are converted to 4,225 cps and 4,325 cps, and then combined with the outgoing speech signals. These signals may be visually monitored by Audio Frequency Radio Frequency Monitor MX-4039/TRC-80 (monitor).

c. Modulator-Multiplier MD-465/TRC-80. The composite speech and teletypewriter signal from the multiplexer is applied to Modulator-Multiplier MD-465/TRC-80 (modulator-multiplier). The signal is phase modulated in the modulator-multiplier and multiplied by a factor of 96. The output of the modulator-multiplier, a 70-mc phase-modulated signal, is applied to Amplifier-Converter AM-3303/TRC-80 (transmit converter). The modulator-multiplier signal is also applied to the monitor for visual monitoring.

Note. Amplifier-Converter AM-4917/TRC receives the 70-mc phase modulated signal from the modulator-multiplier in Radio Terminal Set AN/TRC-80A.

d. Amplifier-Converter AM-3303/TRC-80. The transmit converter accepts two input signals. One signal is a 30- to 34-mc signal from Electrical Frequency Synthesizer 0-937/TRC-80 (synthesizer). The synthesizer signal is multiplied by a factor of 144 and mixed with the 70-mc phase-modulated input signal from the modulator-multiplier. The resultant output signal (in the 4.4- to 5.0-gigacycle frequency range) is applied to Radio Frequency Amplifier AM-3308/TRC-80 (power amplifier).

d.1. Amplifier-Converter AM-4917/TRC. The AN/TRC-80A transmit converter accepts two input signals. One signal is a 1,082.5- to 1,232.4875-mc signal from Electrical Frequency Synthesizer 0-1462A/TRC. The 0-1462A/TRC synthesizer signal is multiplied by a factor of 4 and mixed with the 70-mc phase-modulated input signal f he modulator-multiplier. The resultant outp (in the 4.4- to 5.0-ggc frequency range) to Radio Frequency Amplifier AM-330 (power amplifier).

e. Radio Frequency Amplifier AM-3308/TRC-80. The 4.4- to 5-gigacycle signal from the transmit converter is used as the driving power for a four cavity klystron tube located in the power amplifier. The output of the power amplifier (1 kilowatt) is applied through a flexible waveguide to the bipolarized feedhorn and antenna reflector.

56. Receiving Path

(fig. 38 and 38.1)

a. Antenna AS-1270/TRC-80. Polarized 4.5- to 5.0-gigacycle signals are received by the antenna reflector and passed through the bipolarized feedhorn and a flexible waveguide to a duplexer. In diversity operation, when two signals are being received, the duplexer routes the received signals to the inputs of receiver No. 1 and receiver No. 2.

b. Amplifier-Converter AM-3302/TRC-80. Amplifier-Converter AM-3302/TRC-80 (receive converter) accepts two input signals. One signal is a 30- to 34-mc signal from the synthesizer. The synthesizer signal is multiplied by a factor of 144. The other signal is the incoming radio-frequency (rf) signal from the duplexer. The two signals are applied to a mixer circuit, and a difference frequency of 70 mc is selected, amplified, and routed to Intermediate Frequency Amplifier AM-3288/TRC-80 (if. amplifier).

b.1 Amplifier-Converter AM-4916/TRC-80. The AM-4916/TRC-80 accepts two input signals. One signal is a 1,082.5- to 1,232.4875-mc signal from the 0-1462A/TRC synthesizer. The 0-1462A/TRC synthesizer signal is multiplied by a factor of 4. The other signal is the incoming radiofrequency signal from the duplexer. The two signals are applied to a mixer circuit, and a difference frequency of 70 mc is selected, amplified, and routed to Intermediate Frequency Amplifier AM-3288/TRC-80.

c. Intermediate Frequency Amplifier AM-3288/TRC-80. The 70-mc input to the if. amplifier is mixed with the output of a 78-kc oscillator. The 8-mc difference frequency is amplified and applied to a discriminator circuit that recovers the original vf teletypewriter and speech modulation. When both receivers are used (in diversity operation), the outputs of both if. amplifiers are combined and routed to the multiplexer.

d. Demultiplexer-Multiplexer TD-550/TRC-80. The multiplexer accepts the input from the if. amplifier and separates the teletypewriter and speech signals. Teletypewriter signals are converted from 4,225 cps and 4,325 cps to 1,225 cps and 1,325 cps. The teletypewriter and speech signals are then routed to the control panel and to the monitor for visual observation.

e. Output Circuits. Teletypewriter signals intended for the local teletypewriter are routed from the control panel to the telegraph terminal. The telegraph terminal converts the vf signals to dc signals and applies the dc pulses to the local teletypewriters. Speech signals intended for the operator are routed to the local headset. Speech and teletypewriter signals for pts are applied through the power and signal entry panel to the connecting landlines.

APPENDIX I

REFERENCES

Following is a list of applicable references available to the organizational maintenance personnel of Radio Terminal Set AN/TRC-80.

AR 755-15	Disposal of Unwanted Radioactive Material.
DA Pam 310-4	Index of Technical Manuals, Technical Bulletins, Supply Manuals (types 7, 8, and 9), Supply Bulletins, and Lubrication Orders.
DA Pam 310-7	U. S. Army Equipment Index of Modification Work Orders.
MWO 11-5800-207-30/1	Synthesizer Modification.
TM 11-5805-246-10	Operator's Manual: Terminal, Telegraph, TH-5/TG.
TM 11-5805-246-20	Organizational Maintenance Manual: Terminal, Telegraph TH-5/TG.
TM 11-5805-356-12	Organizational Maintenance Manual: Terminal, Telegraph-Telephone AN/TCC-29.
TM 11-5815-206-12	Organizational Maintenance Manual: Teletypewriter Set AN/PGC-1 and Teletypewriters TT-4A/TG, TT-4B/TG, TT-4C/TG, TT-335/TG, and TT-537/G.
TM 11-5820-469-10	Operator's Manual: Radio Terminal Set AN/TRC-80.
TM 11-5820-469-20P	Organizational Maintenance Repair Parts and Special Tool Lists: Radio Terminal Set AN/TRC-80.
TM 11-6625-274-12	Operator's and Organizational Maintenance Manual: Test Sets, Electron Tube TV-7/U, TV-7A/U, TV-7B/U, and TV-7D/U.
TM 11-6625-366-15	Organizational, DS, GS, and Depot Maintenance Manual: Multimeter TS-352B/U.
TM 38-750	Army Equipment Record Procedures.

APPENDIX II
MAINTENANCE ALLOCATION

Section I. INTRODUCTION

1. General

a. This appendix assigns maintenance functions and repair operations to be performed by the lowest appropriate maintenance echelon. It also specifies the tools and other equipment authorized at each echelon to perform the assigned maintenance functions.

b. Columns in the maintenance allocation chart are as follows:

(1) *Part or component.* This column shows only the nomenclature or standard item name. Additional descriptive data are included only where clarification is necessary to identify the part. Components and parts comprising a major end item are listed alphabetically. Assemblies and subassemblies are in alphabetical sequence with their components listed alphabetically immediately below the assembly listing.

(2) *Maintenance function.* This column indicates the various maintenance functions allocated to the echelon capable of performing the operations.

(a) Service. To clean, to preserve, and to replenish fuel and lubricants.

(b) Adjust. To regulate periodically to prevent malfunction.

(c) Inspect. To verify serviceability and to detect incipient electrical or mechanical failure, by scrutiny.

(d) Test. To verify serviceability and to detect incipient electrical or mechanical failure, by use of special equipment, such as gages, meters, etc.

(e) Replace. To substitute serviceable assemblies, subassemblies, and parts for unserviceable components.

(f) Repair. To restore an item to serviceable condition through correction of a specific failure or unserviceable condition. This function includes, but is not limited to, inspecting, cleaning, preserving, adjusting, replacing, welding, riveting, and straightening.

(g) Align. To adjust two or more components of an electrical system so that their functions are properly synchronized.

(h) Calibrate. To determine, check, or rectify the graduation of an instrument, weapon, or weapons system, or components of a weapons system.

(i) Rebuild. To restore an item to a standard as near as possible to original or new condition in appearance, performance, and life expectancy. This is accomplished through the maintenance technique of complete disassembly of the item, inspection of all parts or components, repair or replacement of worn or unserviceable elements, using original manufacturing tolerances and/or specifications, and subsequent reassembly of the item.

(j) Overlay. To restore an item to completely serviceable condition as prescribed by serviceability standards developed and published by heads of technical services. This is accomplished through employment of the technique of "Inspect and Repair Only as Necessary" (IROAN). Maximum utilization of diagnostic and

test equipment is combined with minimum disassembly of the item during the overhaul process.

(3) *1st, 2d, 3d, 4th, 5th echelon.* The symbol X indicates the echelon responsible for performing that particular maintenance operation, but does not necessarily indicate that repair parts will be stocked at that level. Echelons higher than the echelon marked by X are authorized to perform the indicated operation.

(4) *Tools required.* This column indicates codes assigned to each individual tool equipment, test equipment, and maintenance equipment referenced. The grouping of codes in this column of the maintenance allocation chart indicates the tool, test, and maintenance equipment required to perform the maintenance function.

(5) *Remarks.* Entries in this column will be utilized when necessary to clarify any of the data cited in the preceding columns.

c. Columns in the allocation of tools for maintenance functions are as follows:

(1) *Tools required for maintenance functions.* This column lists tools, test, and maintenance equipment required to perform the maintenance functions.

(2) *1st, 2d, 3d, 4th, 5th echelon.* The dagger (†) symbol indicates the echelons allocated the facility.

(3) *Tool code.* This column lists the tool code assigned.

2. Maintenance by Using Organizations

When this equipment is used by signal service organizations organic to the theater headquarters or communication zones to provide theater communications, those maintenance functions allocated up to and including fourth echelon are authorized to the organization operating this equipment.

Section II. MAINTENANCE ALLOCATION CHART

PART OR COMPONENT	MAINTENANCE FUNCTION	ECHELON 1	2	3	4	5	TOOLS REQUIRED	REMARKS
RADIO TERMINAL SET AN/TRC-80								
	service		x				34	
	adjust	x						
				x			15,16,27,32,35	
	inspect		x				34	
	test		x				16,30	
				x			5,15,16,20,21,23,24, 25,26,27,30,36	
					x		1 thru 5, 7 thru 9,13, 15,16,18,20 thru 27,30 35,36,38	
						x	1 thru 18, 20 thur 29, 31,32,33,35 thru 38	
	repair		x				34 at 2nd, 32 at 3rd thru 5th, 33 at 4th & 5th, 19 at 2nd thru 5th	
	align			x			5,15,16,20,21,27,36	
					x		5,9,15,16,20 thru 23, 25,26,27,32,36	
	overhaul				x		32	Plus shop support
						x	32,33	Plus shop support
AIR CONDITIONER								Separate MAC (Engrs)
AMPLIFIER MODULATOR GROUP OA-3832/TRC-80								
	replace		x				34	
	repair			x			32	
					x		33	
AMPLIFIER CONVERTER AM-3303/TRC-80								
	replace		x				34	
	repair			x			32	
					x		33	
MODULATOR MULTIPLIER MD-465/TRC-80	replace		x				34	
	repair			x			32	
					x		33	
AMPLIFIER, RADIO FREQUENCY AM-3308/TRC	repair		x				34	
				x			32	
					x		33	
CONTROL DRAWER	replace		x				34	
	repair			x			32	
					x		33	
KLYSTRON DRAWER	replace		x				34	
	repair			x			32	
					x		33	

PART OR COMPONENT	MAINTENANCE FUNCTION	ECHELON 1	2	3	4	5	TOOLS REQUIRED	REMARKS
AN/TRC-80 (CONTINUED)								
POWER SUPPLY DRAWER								
	replace		x				34	
	repair			x			32	
					x		33	
ANTENNA AS-1270/TRC-80								
	replace					x	32,33	Plus shop support
	repair		x				34	
				x			32	
					x		33	
FEED HORN AND STRUTS								
	replace	x						
PATCH KIT	replace		x					Expendable
REFLECTOR INFLATABLE	replace		x				34	
	repair		x				19,34	
WAVEGUIDE	replace	x						
CONSOLE, COMMUNICATION CONTROL SB-1564/TRC-80								
	replace		x				34	
	repair			x			32	
	repair				x		33	
COOLER, AIR ELECTRONIC EQIPMENT HD-545/TRC-80								
	replace		x				34	
	repair			x			32	
					x		33	
DEMULTIPLEXER-MULTIPLEXER TD-550/TRC-80								
	replace		x				34	
	repair			x			32	
							33	
ENGINE GENERATOR								Separate MAC (Engrs)
CONTROL PANEL, AUXILIARY (ENGINE GENERATOR)								Separate MAC (Engrs)
HEADSET ASSY								
	replace	x						Running spares
	repair					x	32,33	
MONITOR, AUDIO FREQUENCY-RADIO FREQUENCY MX-4039/TRC-80								
	replace		x				34	
	repair			x			32	
					x		33	

PART OR COMPONENT	MAINTENANCE FUNCTION	ECHELON 1	2	3	4	5	TOOLS REQUIRED	REMARKS
AN/TRC-80 (CONTINUED)								
PANEL, POWER DISTRIBUTION SB-1565/TRC-80	replace		x				34	
	repair			x			32	
					x		33	
RECEIVER, RADIO OA-3831/TRC-80								
	replace		x				34	
	repair			x			32	
	repair				x		33	
AMPLIFIER CONVERTER AM-3302/TRC-80								
	replace		x				34	
	repair			x			32	
					x		33	
AMPLIFIER, IF. AM-3288/TRC-80	replace		x				34	
	repair			x			32	
					x		33	
POWER SUPPLY PP-3313/TRC-80								
	replace		x				34	
	repair			x			32	
					x		33	
POWER SUPPLY PP-3314/TRC-80	replace		x				34	
	repair			x			32	
					x		33	
SYNTHESIZER, ELECTRICAL FREQUENCY O-937/TRC-80								
	replace		x				34	
	repair			x			32	
					x		33	
TELETYPE HYBRID ASSY								
	replace		x				34	
	repair			x			32	
					x		33	
TELETYPEWRITER TT-335/TG								Separate MAC
TERMINAL TELEGRAPH TH-5A/ G.								Separate MAC

Section III. ALLOCATION OF TOOLS FOR MAINTENANCE FUNCTIONS

TOOLS REQUIRED FOR MAINTENANCE FUNCTIONS	ECHELON 1	2	3	4	5	TOOL CODE	REMARKS
AN/TRC-80 (CONTINUED							
Analyzer, Spectrum TS-723/U				†	†	1	
Attenuator, Variable CN-318/U				†	†	2	
Attenuator, Variable CN-762/U				†	†	3	
Attenuator, Variable CN-764/U				†	†	4	
Blower -60 CPS (Collins Radio)			†	†	†	5	**
Calorimeter, Varian V-4030/7A					†	6	*
Comparator, Freq, CM-77/USM				†	†	7	
Frequency Meter AN/URM-80				†	†	8	
Frequency Meter AN/USM-26				†	†	9	
Indicator Standing Wave Ratio AN/USM-37					†.	10	
Loop Converter (Collins Radio #522-6798-00)					†	11	*
Manometer, Vernon Hill and Co. Type C+					†	12	*
Meter, Modulation ME-57			†	†	†	13	
Meter, Noise Figure Hewlett Packard HP 342A					†	14	*
Multimeter ME-26/U			†	†	†	15	
Multimeter TS-352/U		†	†	†	†	16	
Noise source Hewlett Packard HPG-347A					†	17	*
Oscilloscope AN/USM-81				†	†	18	
Patch Kit (for Ant. Bag)		†	†	†	†	19	Expendable
Power Supply PP-3313/TRC-80			†	†	†	20	**
Power Supply PP-3314/TRC-80			†	†	†	21	**
Receiver, Radio R-390/URR				†	†	22	
Signal Generator AN/URM-43			†	†	†	23	
Signal Generator AN/URM-52			†	†	†	24	
Signal Generator AN/USM-44				†	†	25	
Signal Generator AN/GRM-50			†	†	†	26	
Signal Generator SG-71/FCC			†	†	†	27	
Slotted line section Hewlett Packard HPG 810B					†	28	*
Test Set Electron Tube TV-2/U					†	29	
Test Set Electron Tube TV-7/U		†	†	†		30	
Test Set, R.F. Power AN/USM-96A			†	†	†	31	
Tool Kit, Radar and Radio Repair TK-87/U			†	†	†	32	
Tool Kit, Radar and Radio Repair TK-88/U				†	†	33	
Tool Kit Radio Repair TK-115/G			†			34	
Transmission Measuring Set TS-559A/FT				†	†	35	
Voltmeter, ME-30A/U			†	†	†	36	
Water Load, Varian V-4023B					†	37	*
Watch, Stop FSN 6645-719-8670				†	†	38	

*In process of being nomenclatured.
**These items are part of facilities required for bench testing. More will be added as they become available.

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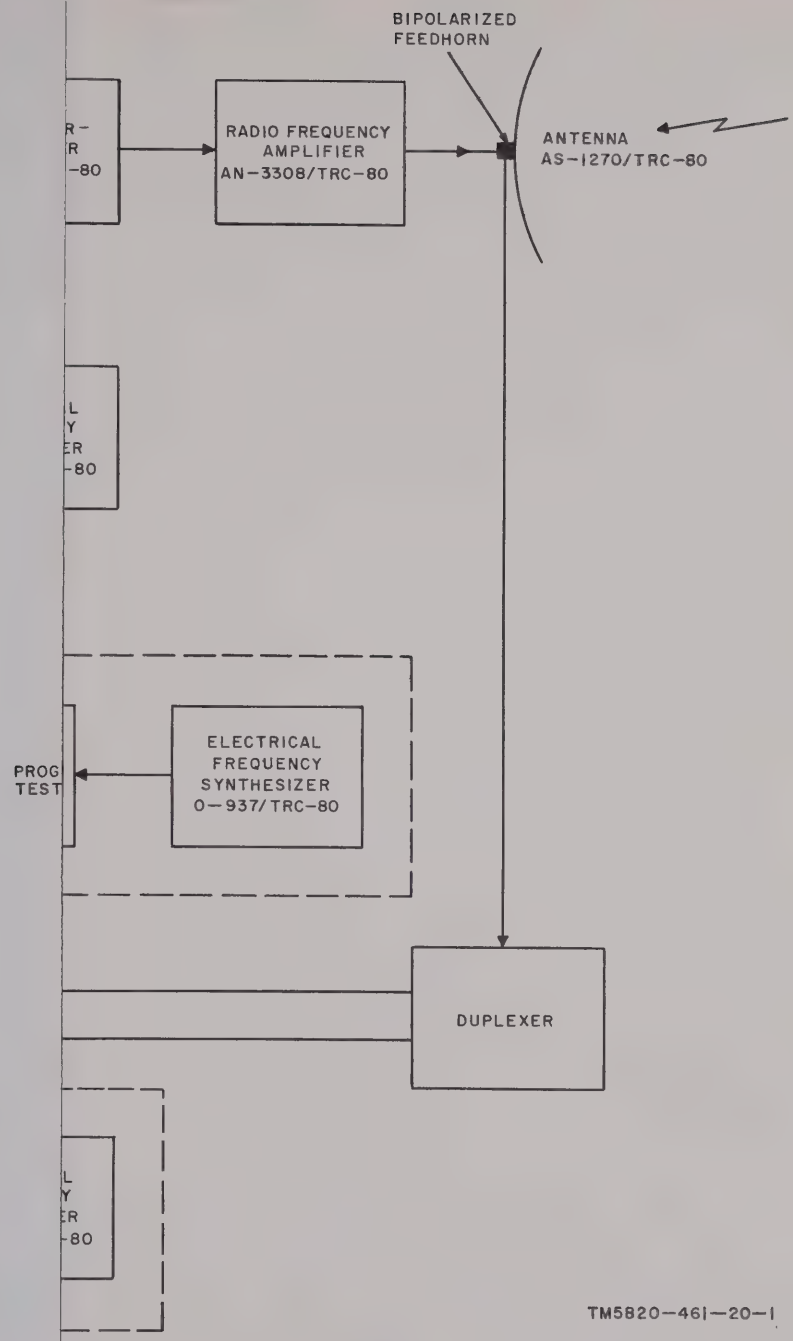
BIPOLARIZED
FEEDHORN
RADIO FREQUENCY
AMPLIFIER
AN-3308/TRC-80
ANTENNA
AS-1270/TRC-80
ELECTRICAL
FREQUENCY
SYNTHESIZER
O-937/TRC-80
DUPLEXER
TM5820-461-20-1

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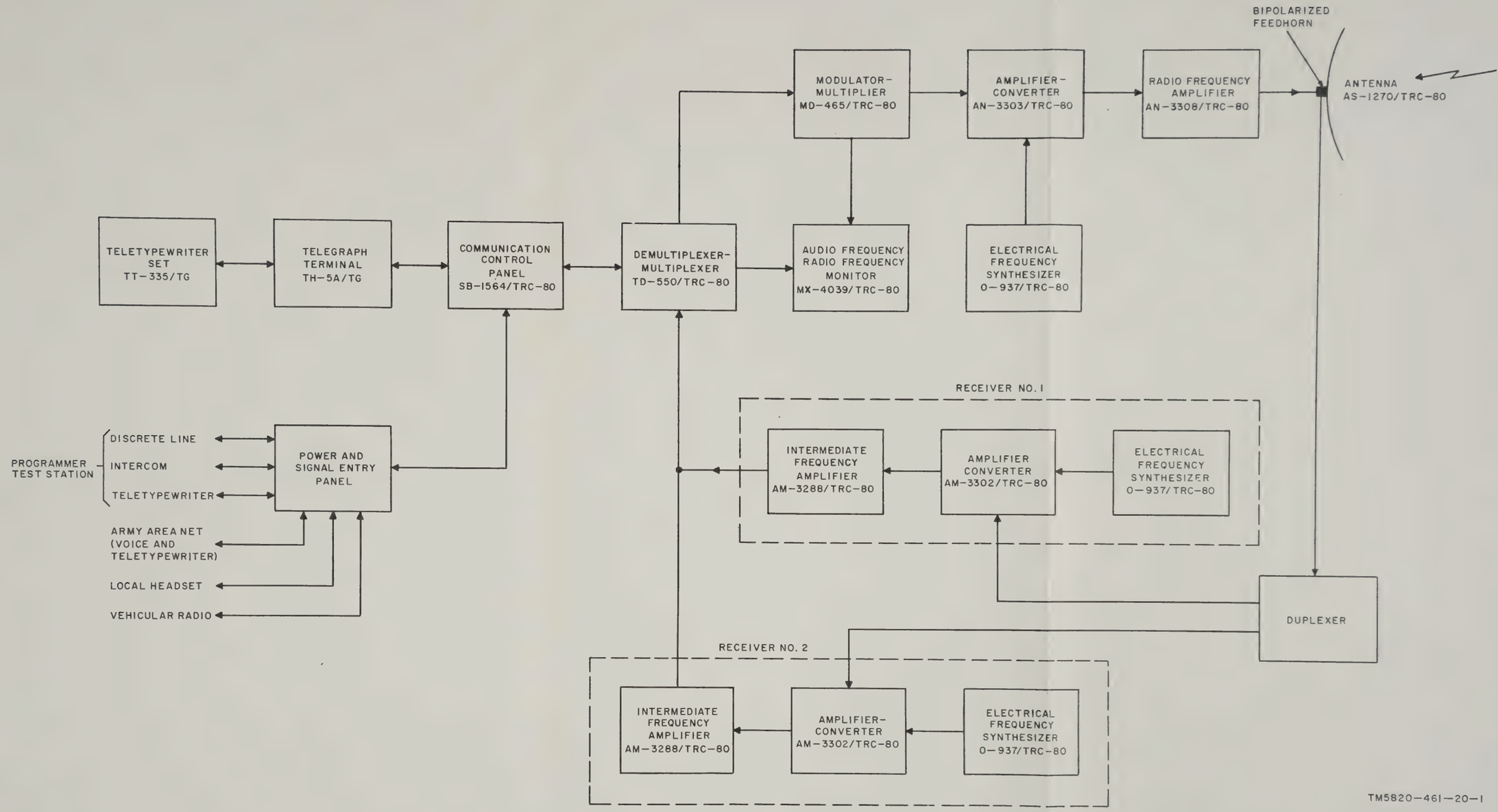
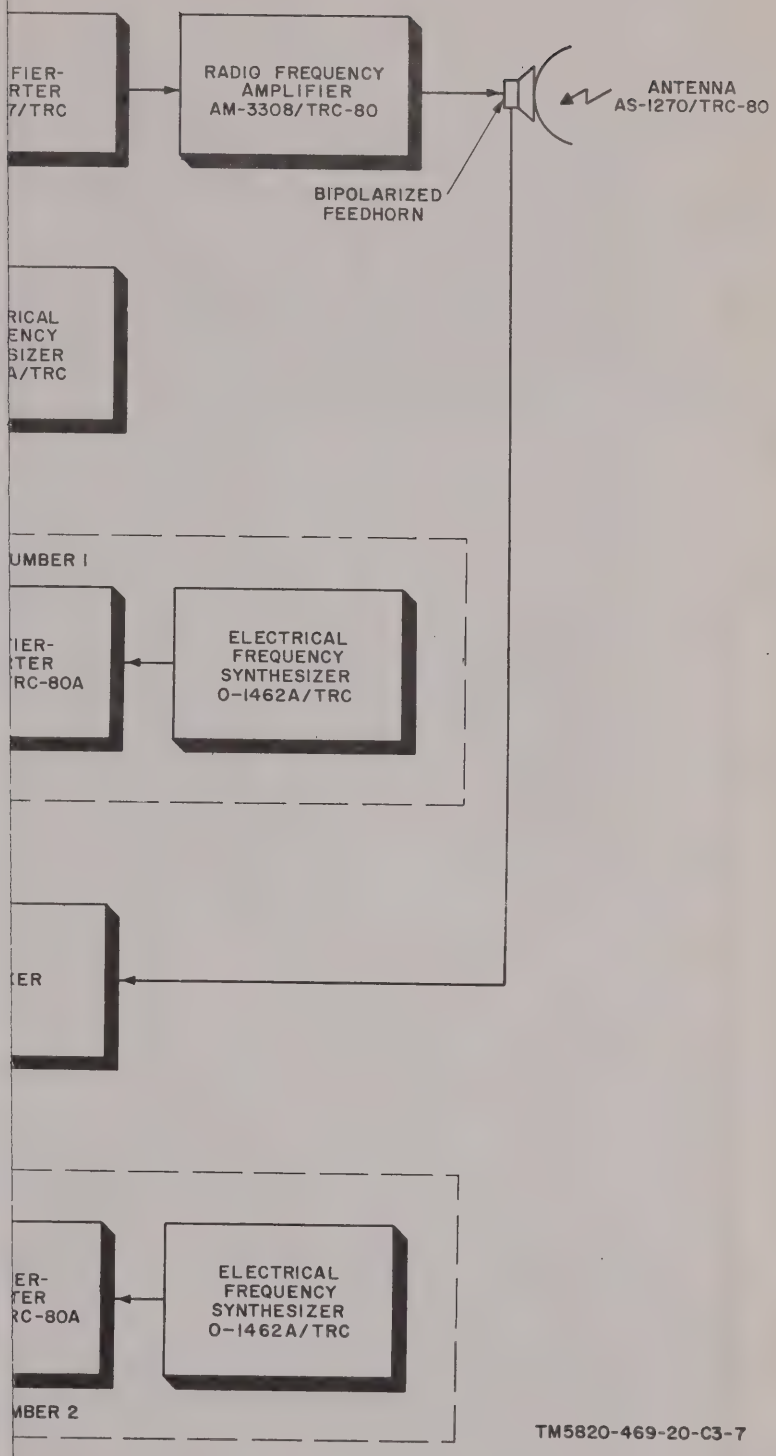


Figure 38. Radio Terminal Set AN/TRC-80, simplified block diagram.



Set AN/TRC-80A, simplified block diagram.

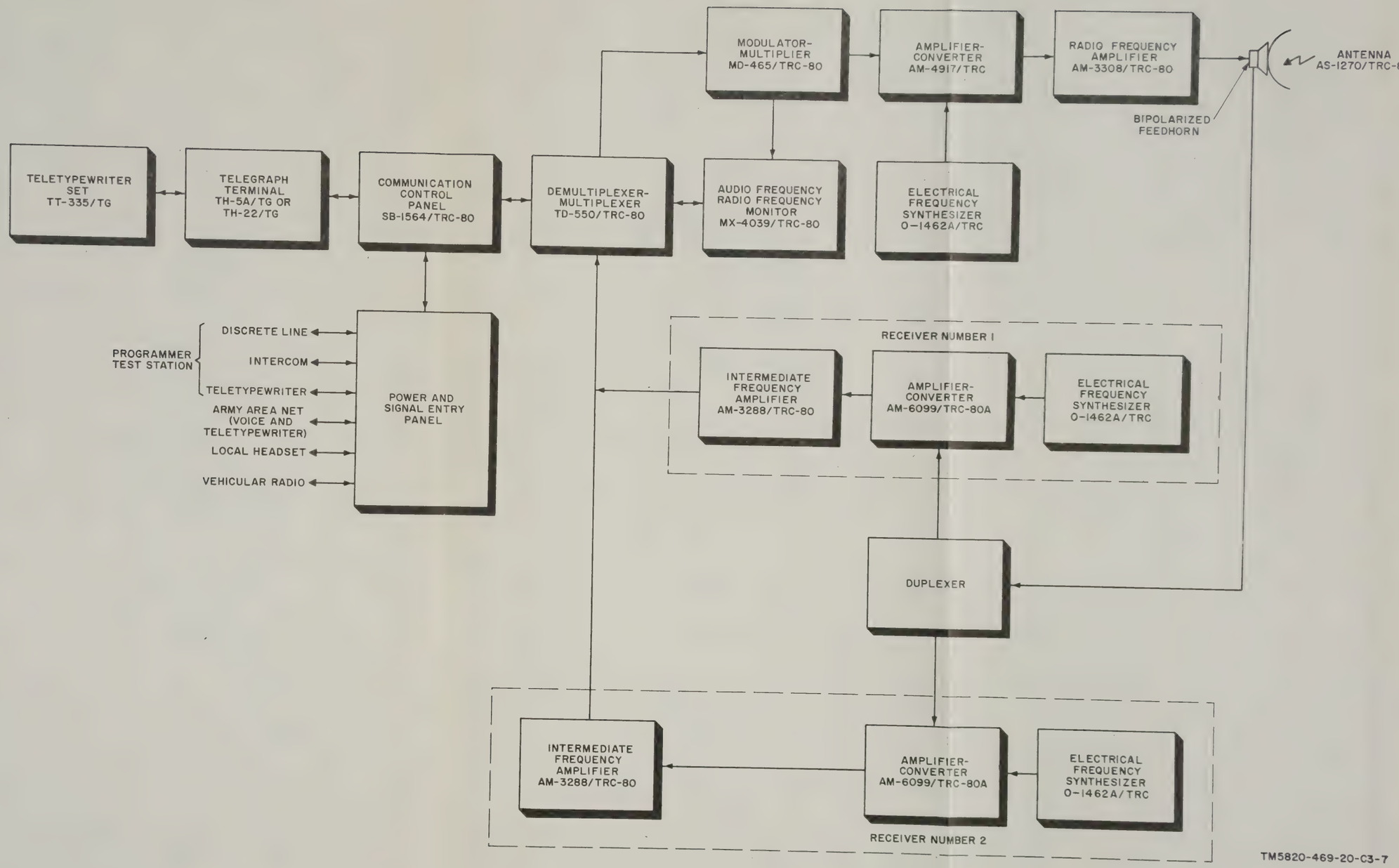
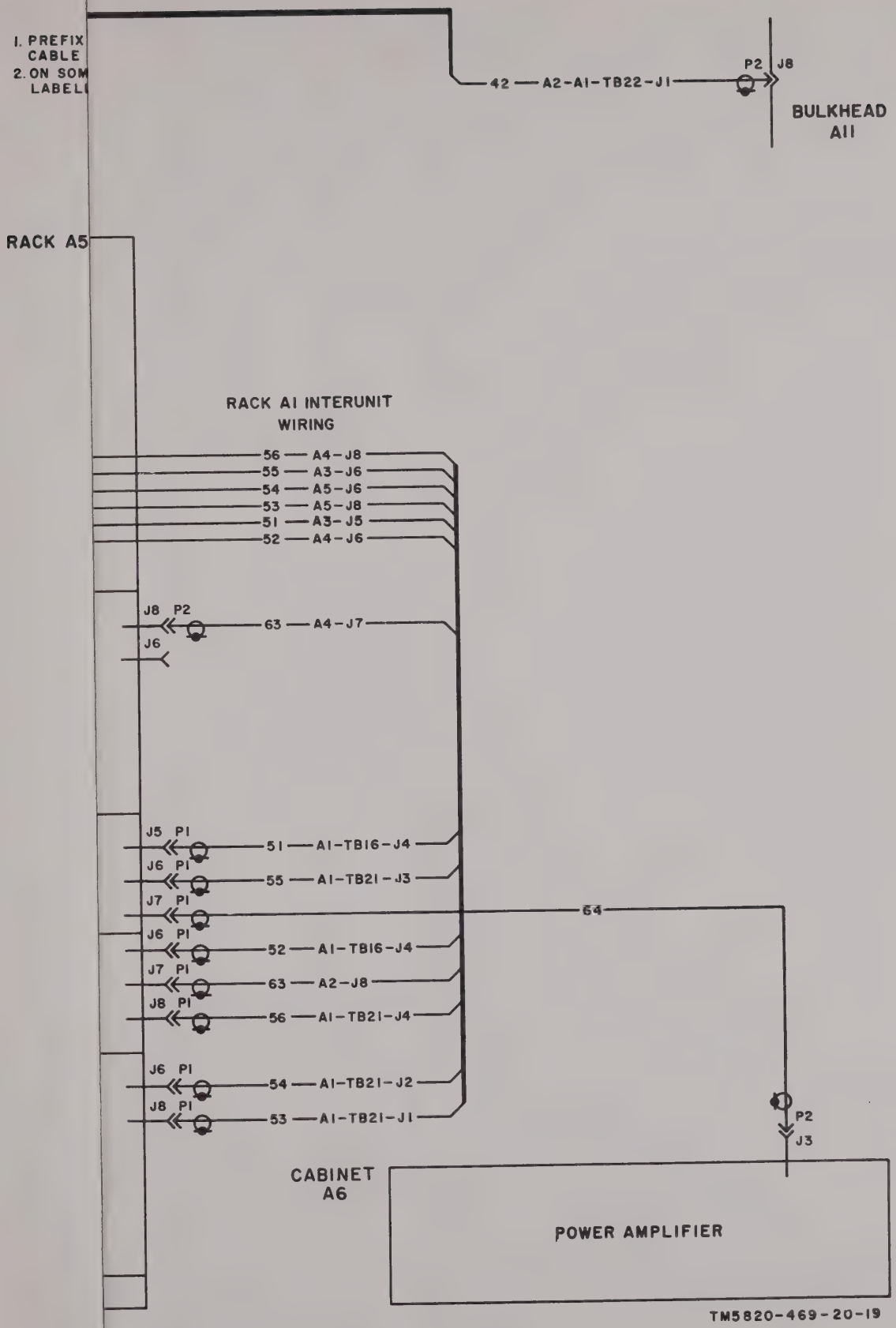


Figure 38-1. *Radio Terminal Set AN/TRC-80A, simplified block diagram.*


1. PREFIX
CABLE
2. ON SOM
LABEL
42 — A2-A1-TB22-J1
P2
J8
BULKHEAD
A11
RACK A5
RACK A1 INTERUNIT
WIRING
56 — A4-J8
55 — A3-J6
54 — A5-J6
53 — A5-J8
51 — A3-J5
52 — A4-J6
J8 P2
63 — A4-J7
J6
J5 P1
51 — A1-TB16-J4
J6 P1
55 — A1-TB21-J3
J7 P1
64
J6 P1
52 — A1-TB16-J4
J7 P1
63 — A2-J8
J8 P1
56 — A1-TB21-J4
J6 P1
54 — A1-TB21-J2
J8 P1
53 — A1-TB21-J1
P2
J3
CABINET
A6
POWER AMPLIFIER
TM5820-469-20-19

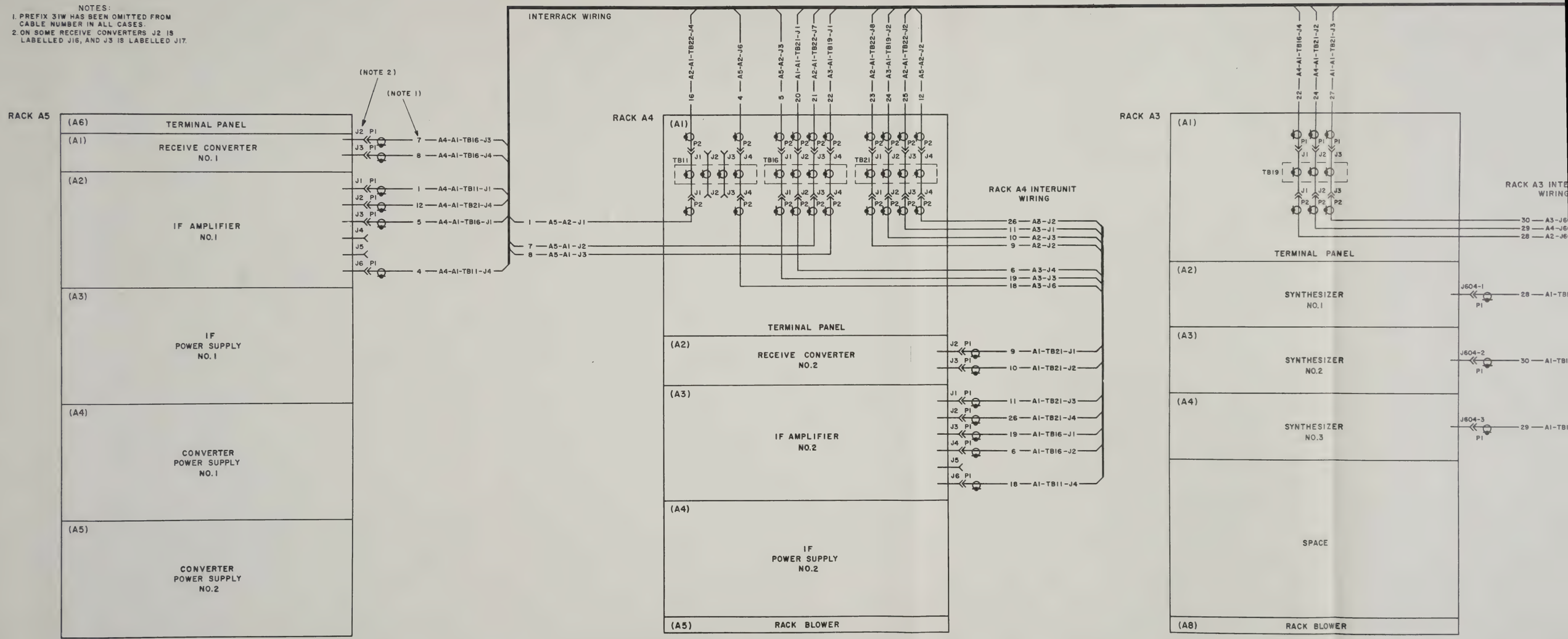


Figure 39. Coaxial cable dia

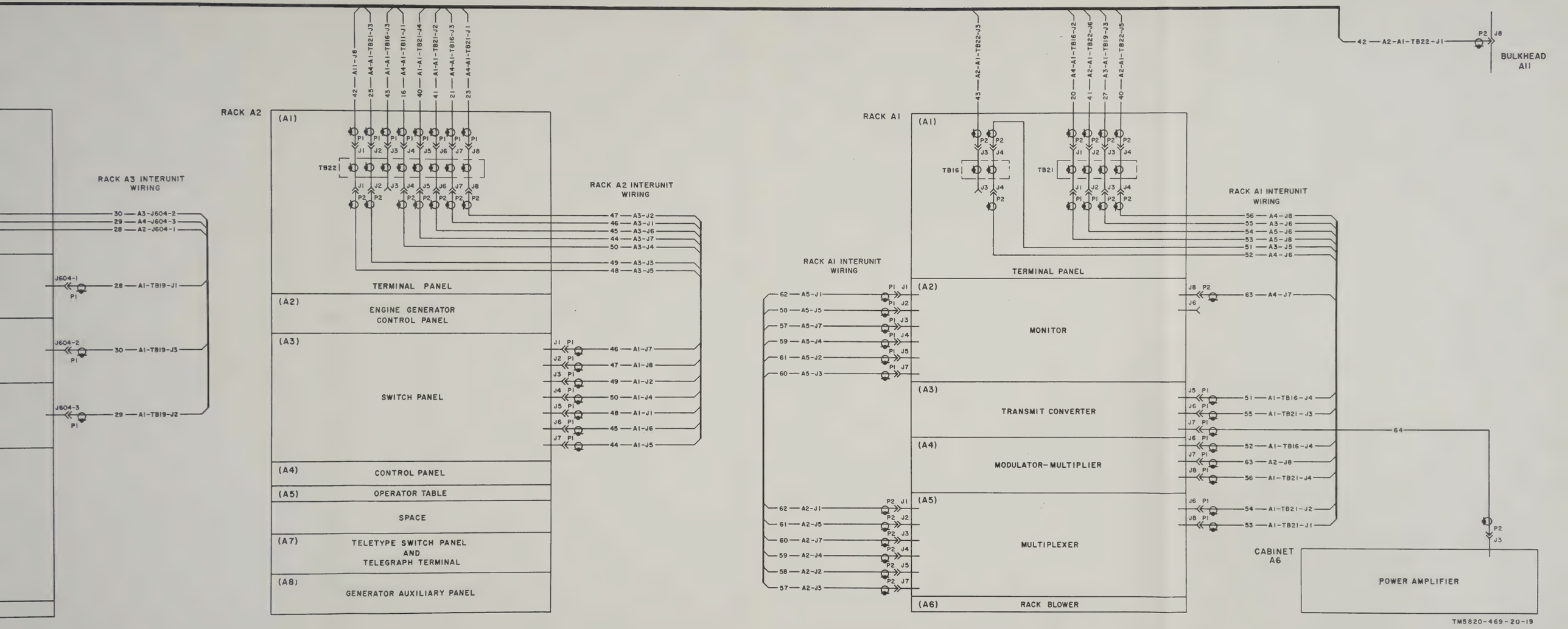
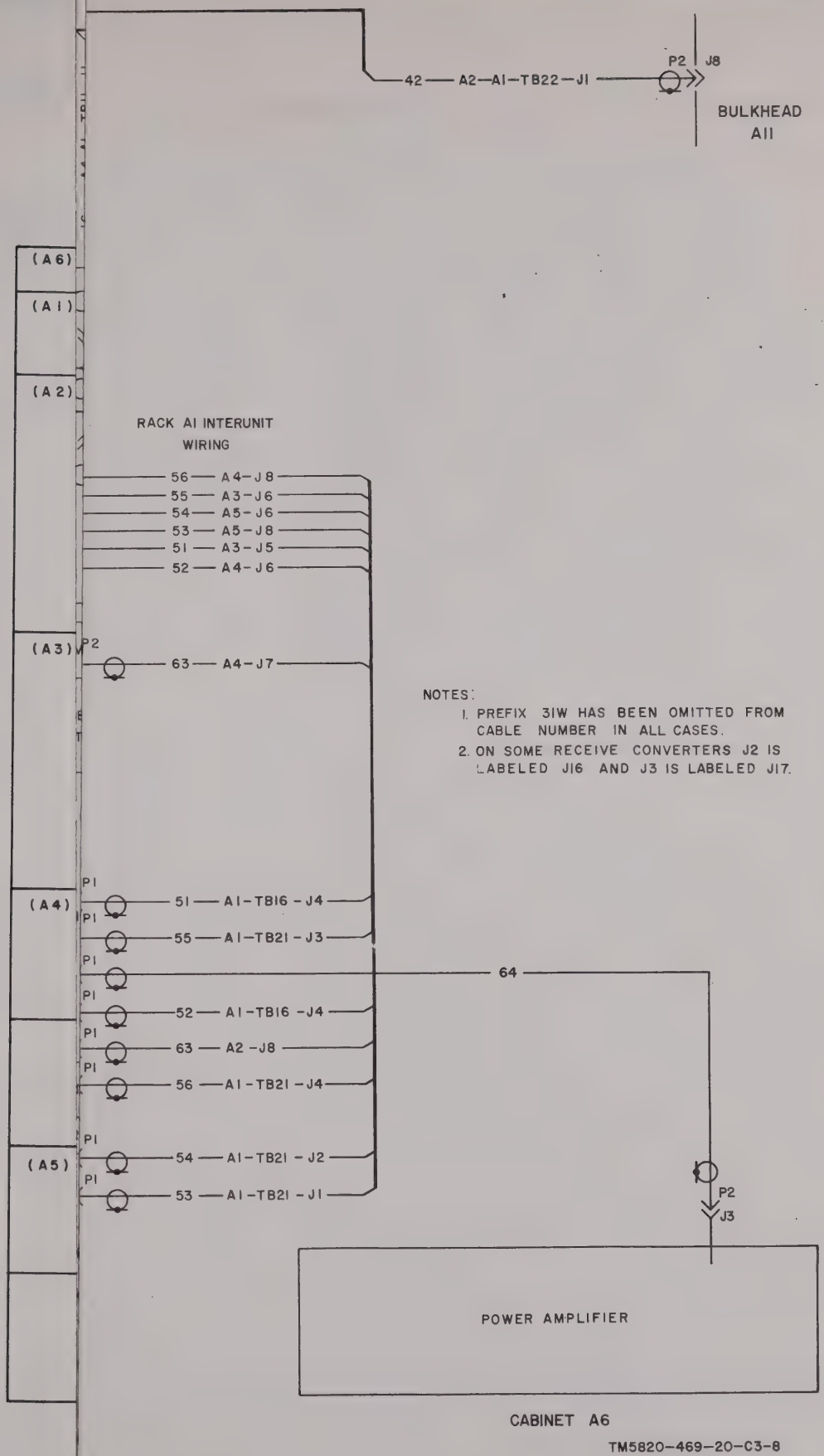
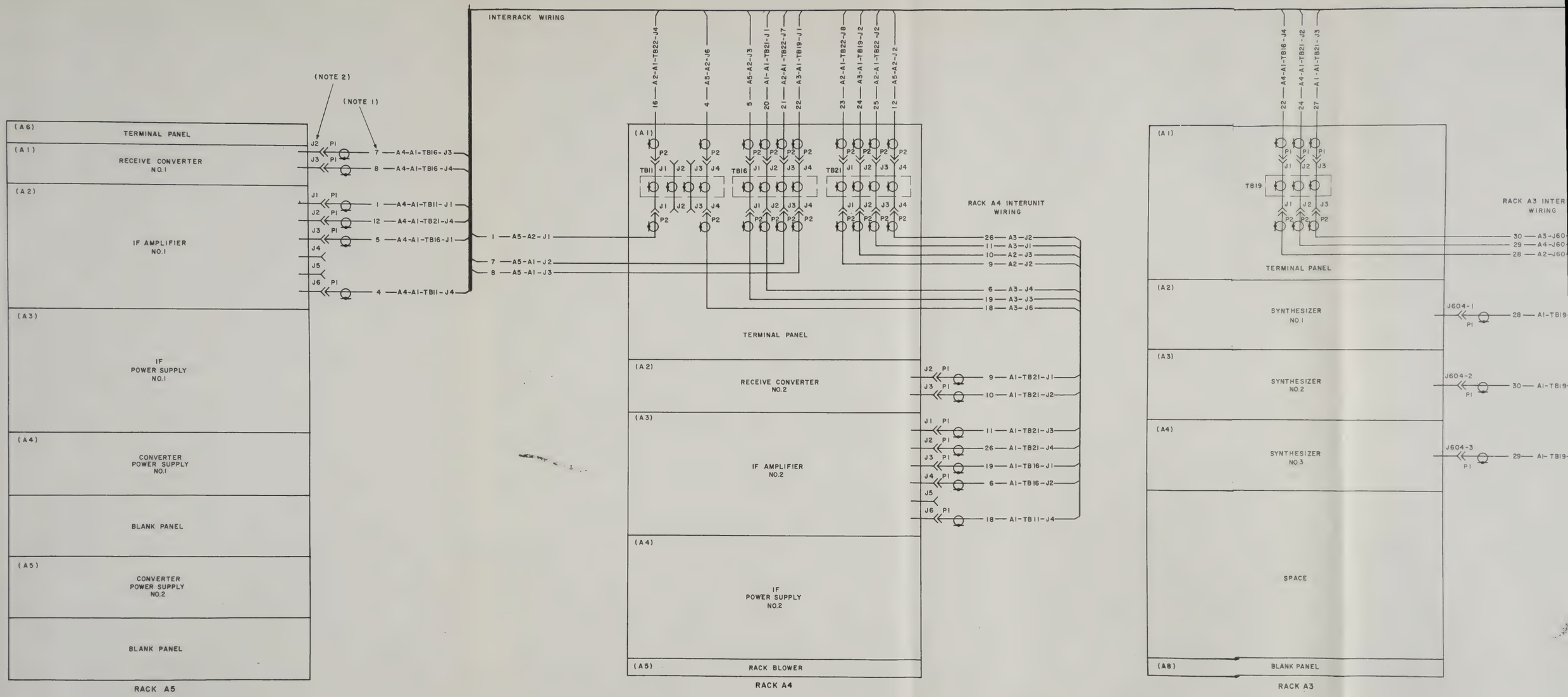


Figure 39. Coaxial cable diagram.



39.1. *Coaxial cable diagram, AN/TRC-80A.*


INTERRACK WIRING
(NOTE 2)
(NOTE 1)
(A6) TERMINAL PANEL
(A1) RECEIVE CONVERTER NO.1
(A2) IF AMPLIFIER NO.1
(A3) IF POWER SUPPLY NO.1
(A4) CONVERTER POWER SUPPLY NO.1
BLANK PANEL
(A5) CONVERTER POWER SUPPLY NO.2
BLANK PANEL
RACK A5
J2 P1 7 — A4-A1-TB16-J3
J3 P1 8 — A4-A1-TB16-J4
J1 P1 1 — A4-A1-TB11-J1
J2 P1 12 — A4-A1-TB21-J4
J3 P1 5 — A4-A1-TB16-J1
J4
J5
J6 P1 4 — A4-A1-TB11-J4
1 — A5-A2-J1
7 — A5-A1-J2
8 — A5-A1-J3
16 — A2-A1-TB22-J4
4 — A5-A2-J6
5 — A5-A2-J3
20 — A1-A1-TB21-J1
21 — A2-A1-TB22-J7
22 — A3-A1-TB19-J1
23 — A2-A1-TB22-J8
24 — A3-A1-TB19-J2
25 — A2-A1-TB22-J2
12 — A5-A2-J2
(A1)
TB11 J1 J2 J3 J4
TB16 J1 J2 J3 J4
TB21 J1 J2 J3 J4
TERMINAL PANEL
(A2) RECEIVE CONVERTER NO.2
(A3) IF AMPLIFIER NO.2
(A4) IF POWER SUPPLY NO.2
(A5) RACK BLOWER
RACK A4
RACK A4 INTERUNIT WIRING
26 — A3-J2
11 — A3-J1
10 — A2-J3
9 — A2-J2
6 — A3-J4
19 — A3-J3
18 — A3-J6
J2 P1 9 — A1-TB21-J1
J3 P1 10 — A1-TB21-J2
J1 P1 11 — A1-TB21-J3
J2 P1 26 — A1-TB21-J4
J3 P1 19 — A1-TB16-J1
J4 P1 6 — A1-TB16-J2
J5
J6 P1 18 — A1-TB11-J4
22 — A4-A1-TB16-J4
24 — A4-A1-TB21-J2
27 — A1-A1-TB21-J3
(A1)
TB19 J1 J2 J3
TERMINAL PANEL
(A2) SYNTHESIZER NO.1
(A3) SYNTHESIZER NO.2
(A4) SYNTHESIZER NO.3
SPACE
(A8) BLANK PANEL
RACK A3
RACK A3 INTER WIRING
30 — A3-J60
29 — A4-J60
28 — A2-J60
J604-1 P1 28 — A1-TB19
J604-2 P1 30 — A1-TB19
J604-3 P1 29 — A1-TB19

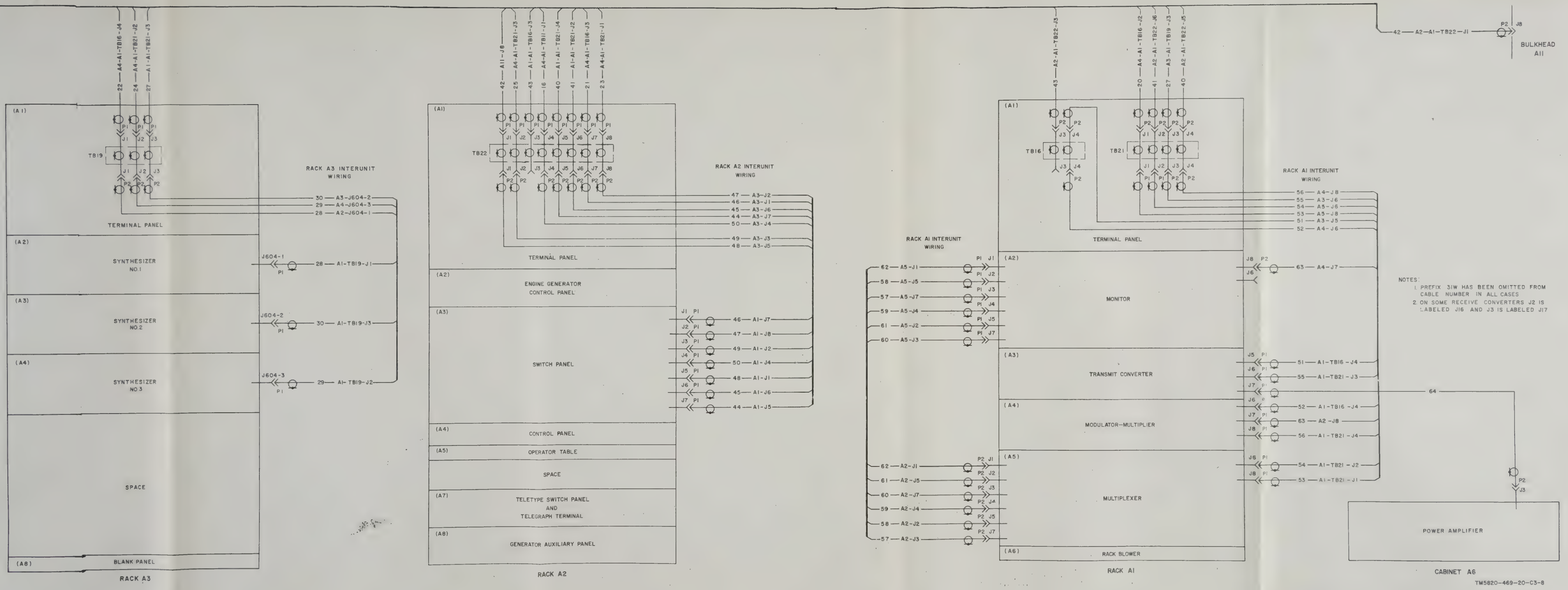


Figure 39.1. Coaxial cable diagram, AN/TRC-80A.

By Order of Secretary of the Army:

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